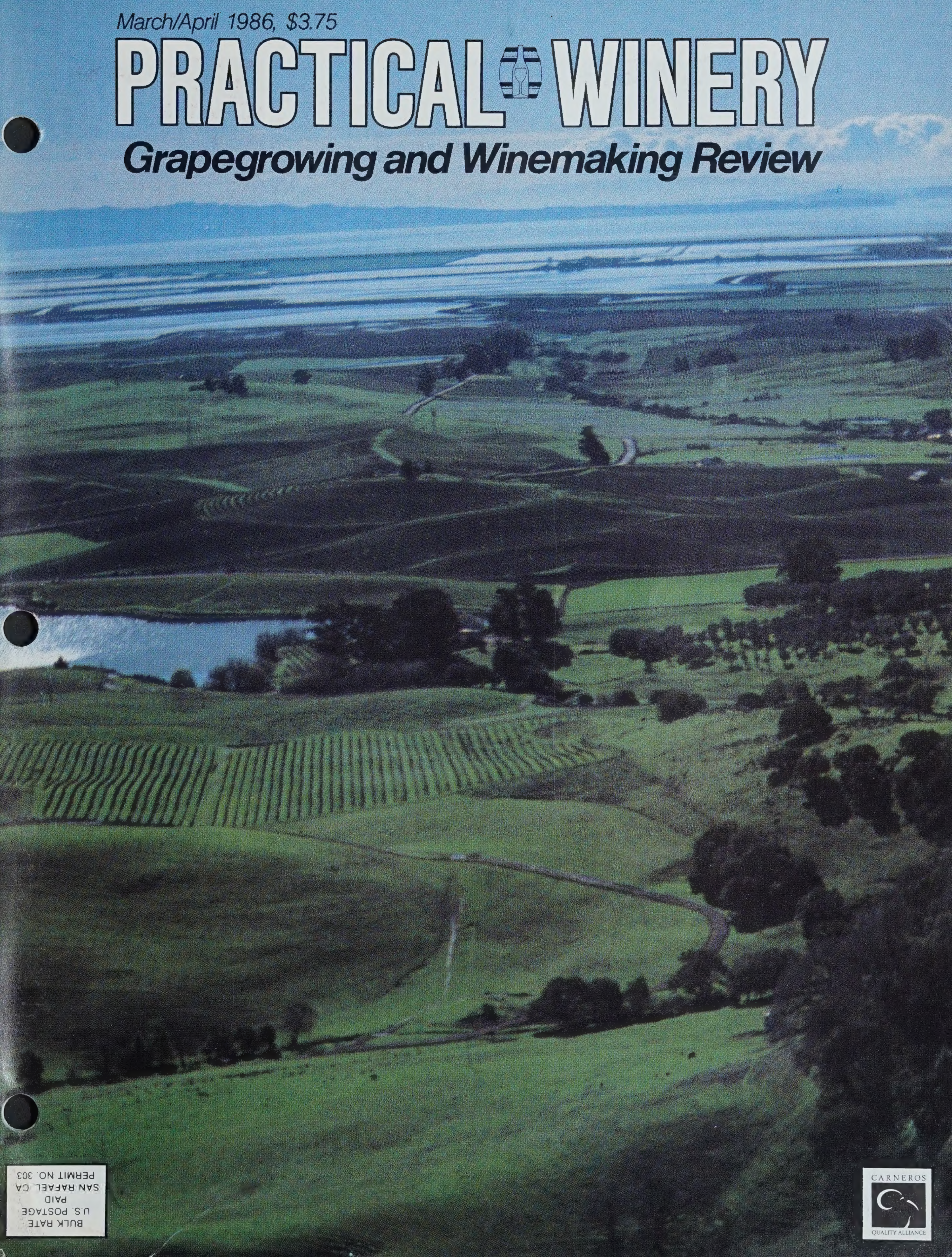
March/April 1986, $3.75

PRACTICAL WINERY

Grapegrowing and Winemaking Review



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PRACTICAL WINERY

Grapegrowing and Winemaking Review

MARCH/APRIL 1986 VOLUME VI, NO. 6

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> *"I have enjoyed great health at a great age because everyday I can remember I have consumed a bottle of wine, except when I have not felt well. Then I have consumed two bottles."*
>
> Bishop of Seville

see page 22

see page 31

Cover

Los Carneros viticultural district looking south from Winery Lake Vineyard to San Pablo Bay.

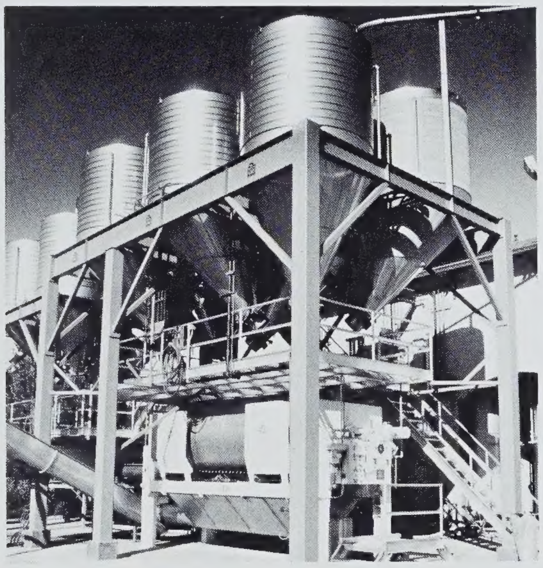
Letters to the Editor

Dear Editor:

I want to tell you that's a helluva magazine! I don't recall how long ago it was that I subscribed when *PRACTICAL WINERY* started, perhaps four or five years ago. What an emergence! I couldn't believe it! I received the May/June 1985 issue with the stories on capsules and it was *complete*. I've already spent 1 ½ hours with the Jan/Feb 1986 issue and I'm not done.

The *ASEV Journal* is too 'scientific'. *Wines & Vines* is good, but not at all into the *intrinsics* of wine. Your publication is right down my pike; I love it. It's not really *that* far off from the Mickey Mouse methods I remember in the early issues that were practical solutions to quite universal problems, usually for small-time operators. That 'practical' part of your name comes through still. Obviously advertisers have recognized how central you are in the wine business.

Compliments to the staff,
James Arthur Field
Orinda, CA



Dear Editor:

We wish to correct any misunderstanding which may have occurred from the layout on page 41 of the Jan/Feb 1986 story 'New Press Installations'. The Willmes TP-12 at Chateau St. Jean, Kenwood, CA (photograph above), and a Willmes UP 5000 (photographed at Yayin Corp. Forestville, CA) were sold, installed and serviced by SEN Machines, Inc., 3095 Kerner Blvd., Suite G, San Rafael, CA 94901; (415) 457-5155.

Thank you,
Dieter Hartmann
SEN Machines, Inc.

Dear Editor:

I hold *PRACTICAL WINERY* in very high esteem and have enjoyed every issue since #1!

In your Nov/Dec 1985 'Letters to the Editor' section, in your answer to Mr. Clissold of Pennsylvania, you say that I am not necessarily in error in stating that low temperatures are not conducive to glycerin build-up, contrary to Lisa Van der Water's statement.

All other factors being equal, glycerol production is related to temperature of fermentation. At 15°C, 62 g/L of glycerol is produced, compared to 78 g/L at 35°C. The subject of the temperature-alcohol-glycerol relationship has been treated exhaustively by Ms. S. Lafon's doctoral thesis, 'Contribution a l'etude de la formation des produits secondaires de la fermentation alcoolique', Bordeaux 1955.

Further, the basic enology treatise, 'Sciences et techniques du vin, tome 2' (pages 299 and following from J. Ribereau-Gayon, E. Peynaud, P. Ribereau-Gayon and P. Suddad) concur, with statements on the subject, with Dietrich's 'Microbiologie des Weines', pages 100-101, related to by-products build-up in relation to temperature.

Results of experiments by the French state enology agency Sicarex of Nantes, conducted from 1979 to 1982, concludes that low fermentation temperatures (12°-14°C) are not conducive to glycerin build-up.

Studies were conducted by Alain Poulard, Marc Brelet and Yannick Rousset, enologists. These results are published in the Institut Technique du Vin publication 'Vignes et Vins' #330, June 1983.

Further references include a study by S. Bison, B. Daulny, and A. Bertrand, 'Influence de la temperature de fermentation sur la composition d'un vin blanc sec', *Connaissance de la Vigne*, 1980, no. 3, pages 195-202.

Contrary to Lisa Van der Water's winemaker friends, I find—after 30 years of practical winemaking—that very cold fermentation produces 'scratchy' wines, without sufficient glycerin.

Lisa is right in stating that late harvest grapes may be fermented at very low temperatures. Late harvest grapes, and particularly noble rot grapes, already hold glycerin at the start due to the action of *Botrytis cinerea*. Fermentation glycerol is not sought in this case by the enologist.

Sincerely yours,
Jacques A. Recht

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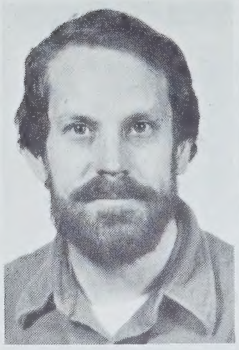

The Wine Retailer

Stan Hock

Chardonnay—Boom or Bust?

The times they are a-changin' in the California wine industry, and there is no better illustration of this than the current plight of premium Chardonnay producers.

That there could ever be an oversupply of Chardonnay seemed inconceivable ten years ago, when a scarcity of the wine began to drive grape and bottle prices skyward and attract a horde of new producers to the field. Yet that is precisely the case today, and it is causing no end of distress to Chardonnay producers large and small, famous and obscure. In fact, the situation is symptomatic of the profound economic difficulties facing *all* small wineries in an era of shrinking demand and ever-burgeoning supply.

To fully appreciate how dramatically the market for domestic Chardonnay has changed in recent years, it's helpful to consider some basic facts and figures. In 1978, there were 13,486 acres of Chardonnay vines planted in California. The bearing acreage of this total yielded about 21,500 tons of Chardonnay grapes, which—if you figure that a ton of grapes produces about 60 cases of wine—translates into roughly 1,300,000 cases.

By contrast, in 1984 there were 26,143 acres of Chardonnay planted, and they provided 70,250 tons of grapes which, if all were turned into varietal wine, would have yielded over 4,200,000 cases of Chardonnay, a *320%* increase in production over 1978. Another fact that illustrates the point is that, whereas there were only 194 American wineries producing Chardonnay in 1979, the total by 1985 had reached 554. Chardonnay production, since the late 1970s, has become big business.

Aye, but there's the rub. There's too much of the stuff around these days, which is putting the squeeze on the very people who instigated its popularity and whose livelihoods depend upon its sale.

"Production has definitely outstripped demand," says Bruce Neyers, sales manager of Joseph Phelps Winery in St. Helena, CA, and proprietor of Neyers, his own label, which specializes in high-quality Chardonnay and Cabernet Sauvignon.

"Sales have flattened out. We've noticed, at Phelps, that there are price points beyond which sales drop geometrically. Our Chardonnay sales still increase each year arithmetically, but we no longer have the geometric growth we once had."

Neyers has a theory, beyond a simple supply/demand postulation, that helps explain the Chardonnay producers' dilemma, and his assessment is supported by many other winemakers I spoke to. Basically, Neyers believes that technical advances in Chardonnay production have enabled the vast majority of producers—given that they're working with good fruit—to make wines that are roughly comparable, in style and quality, to all but the most exceptional produced in California. As Neyers puts it, "There's a great middle ground of style. The vast majority of Chardonnays are pretty much the same, so it becomes a pricing game."

Of course, when small wineries are forced to tinker with their prices (most often accomplished through post-offs or quantity discounts, rather than through direct price reductions) in order to secure 'market share', it can seriously upset their long-range financial planning and make it difficult for them to meet their debt obligations. When market conditions force hundreds of small wineries into this price reduction strategy, the whole apple cart, overburdened and precarious to begin with, starts to shake, rattle and roll.

Wineries whose tiny production and unimpeachable reputations normally buffer them from market fluctuations admit to being affected, too. Dr. William Casey, owner of St. Clement Winery in Napa Valley, can greet turbulent times with at least the veneer of serenity, because he knows there's a market for his 5,000 cases of $14.50 Chardonnay—but the wine no longer sells out two months after release as it used to.

"Actually, it's a blessing in disguise, because we can keep our retail and restaurant accounts supplied year-round, which was not the case in the past," Casey maintains. Still, he freely admits that he "wouldn't even consider opening a winery right now," and cites the problems of overproduction, the bewildering jumble of new labels on the market and severe competition from French white Burgundies, particularly in east coast markets.

"I don't think less Chardonnay is being consumed," Casey says, "but clearly there's a lot of it on the market and, since consumers are fickle, it takes longer to sell." As bad as things have become for some wineries, however, Casey believes it is the growers who stand to suffer the most from a glut of Chardonnay.

"Wineries can cut back their production," he says, "but they do so at the expense of the grower. God knows what's going to happen when more new plantings come in."

Mike Richmond of Acacia, a Napa winery whose reputation rests on five vineyard-designated Chardonnays in addition to several vineyard-designated Pinot Noirs, supplied an answer to Dr. Casey's rhetorical question. During the past harvest, according to Richmond, growers besieged him, offering their Chardonnay fruit for startlingly low prices, sometimes even for nothing.

Thus, Richmond's analysis of the Chardonnay market echoes

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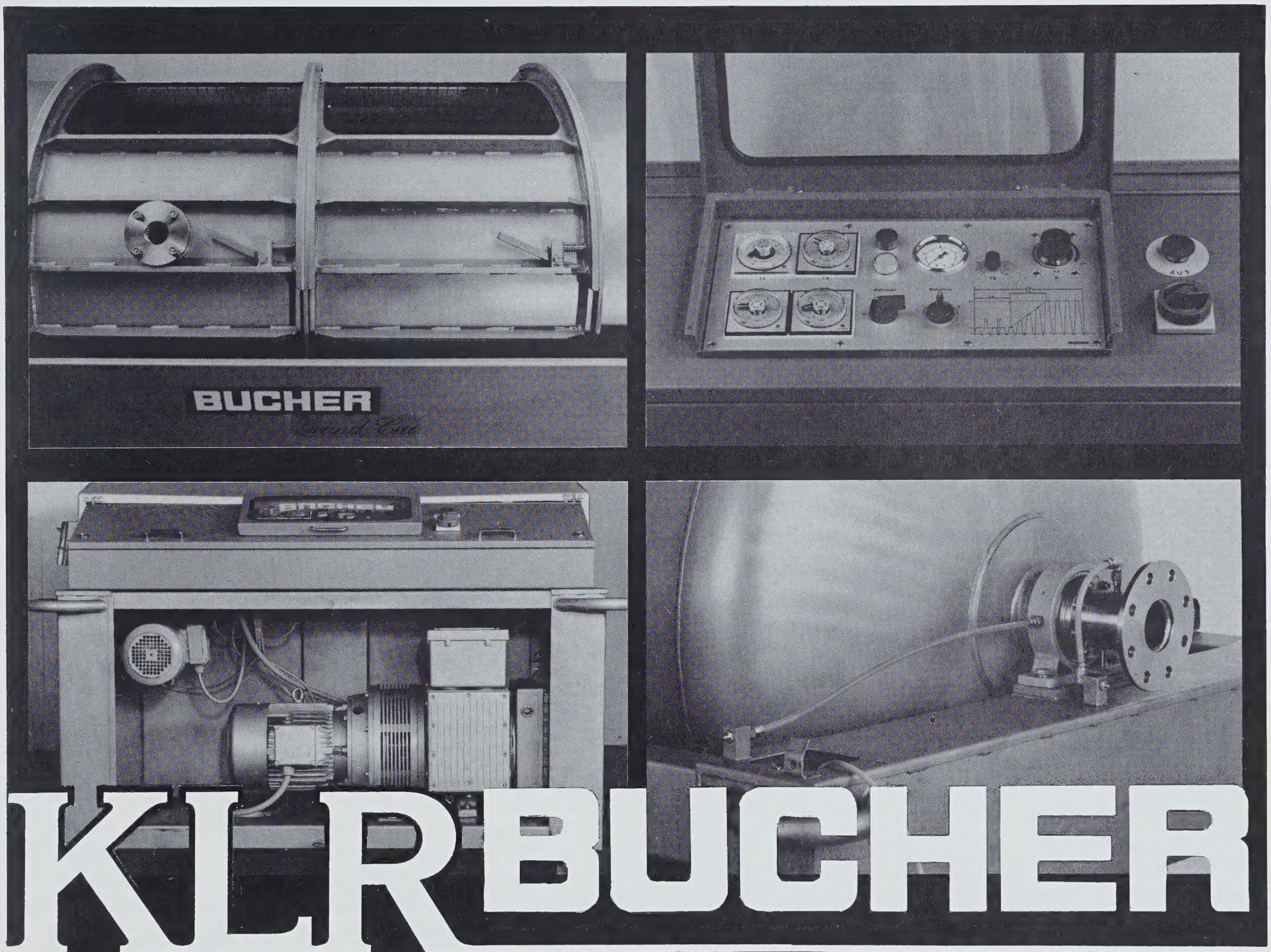
Bruce Neyers. "There is more Chardonnay being grown today than people can drink, and exacerbating that is the fact that we're in a static market that has been resisting American wines." Consequently, Richmond admits, Acacia wines are not selling as briskly as they did a few years ago—when Acacia was the hot new winery on the block—but he maintains that "we're selling as much as we've ever sold."

Nonetheless, Acacia—synonymous in many knowledgeable consumers' minds with high-quality Chardonnay—has had to make some strategic adjustments in their marketing plans. "We're selling the bulk of our wines to restaurants now, where there's less price sensitivity," Richmond concedes. "People may want a $5 Chardonnay to take home to drink under cover of darkness, but, in a restaurant, they want a fine wine with a fancy label."

And what does he foresee for the premium Chardonnay market? "I think the best model for Chardonnay is Cabernet Sauvignon," Richmond says. "It was the first wine in California to receive the level of mass acceptance now accorded to Chardonnay, and I think they're both going to remain, forever, the strongest varieties." Richmond also sees the price of premium Chardonnay falling. "Given the amount of wine on the market and the fact that many vineyards now get 6–7 tons/acre, there's no reason why Chardonnay grapes should ever cost $2,000/ton."

Yet Richmond also believes that there will always be expensive Chardonnays, especially from Napa. "There will always be people who want to spend more money," he maintains, "people who want to buy a legend."

Although all the Chardonnay producers I spoke to were confident that their well-established reputations, sound marketing practices and—when necessary—strategic price reductions would steer them safely through the rough waters of an over-supplied market, one voice did offer a much more radical assessment of the current situation and an almost apocalyptic vision of the future of the small winery.



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Tony Cartlidge is a charismatic Englishman whose comic demeanor does not conceal his keen understanding of how the American wine industry works. Cartlidge has made an impact on the domestic Chardonnay scene with his Stratford and Cartlidge & Browne labels, two medium-priced Chardonnays that have been tremendously well-received in the market. Originally a negociant venture, Cartlidge's two Chardonnays are now produced almost entirely from purchased grapes, and plans are afoot for a winery on the Silverado Trail in Napa. Given Cartlidge's success with these wines—Stratford's production has grown from 5,000 to 60,000 cases, and is sold nationally—his provocative opinions are worth considering.

In Cartlidge's view, the current travails of the premium Chardonnay producer are reflective of the fundamental vulnerabilities and misguided premises of small wineries in general.

“The boom years [of the 1970s] were bullshit,” he says bluntly. “They encouraged small wineries to base their operations on a scarcity situation that was very short-lived.” Now that it's ended—“it was like the Gold Rush era,” Cartlidge quips.” “Someone should write a book about it”—that is, wineries that entered the market paying top dollar for land, equipment and financing and are now having a hard time making ends meet, because there's no longer a receptive audience for their high-priced wines.

Cartlidge, in fact, questions the very assumption that a small winery can be economically viable in today's market. “Economics of scale apply incredibly to the wine business,” he insists, asserting that most small wineries do not possess them. “The idea that modern wine production and marketing can be a cottage industry is a joke. If this business were based on hard-headed economics, half the small wineries would have been closed by now. The only reason so many are hanging on is that they're owned by wealthy people who have the money and will to stick with it, but how long can these guys keep losing money?”

Much of the intrinsic problem, according to Cartlidge, stems from an inability to grasp the true meaning and purpose of marketing and, on this point at least, he is supported by his colleagues. Many small producers, Cartlidge claims, “are in a no-man's land. They don't have enough wine to justify a major marketing effort, yet they have too much to sell without one.” The goal of marketing, he says, is not simply sales, but “brand development,” which makes your product something more than simply “a disposable commodity.”

“To be successful in this business,” Cartlidge elaborates, “you have to become economically important to distributors, and that means volume, without which you can't establish brand identity.”

Robert Pecota, a Napa winemaker who produces Chardonnays under his own label, as well as for other growers and negociants, disagrees with Cartlidge's main argument—that the small winery is doomed economically—but heartily concurs with his comments about marketing. “The main problem in the industry right now,” Pecota declares, “is the inability of producers to distinguish between sales and marketing. When a wine's front-line price becomes meaningless because of all the discounting that's going on in an effort to sell it, that undermines the overall marketing effort and the identity of that wine. It all starts because Chardonnay prices are inflated.”

This is Tony Cartlidge's point precisely. He doesn't see why any but the most exceptional Chardonnays should cost more than $8 or $9. “The *real* price of good Chardonnay grapes is about $850–$900/ton,” he states flatly, implying that prevailing prices—which are in the $1,200–$1,500/ton range—are totally out of alignment with the realities of the current market. Citing the success of his Stratford label—with a front-line price of $8.50—and similarly-priced Chardonnays from Burgess and Kendall-Jackson, Cartlidge argues, only half in jest, that those small wineries struggling to sell a few thousand cases of expensive Chardonnay should consider slashing their prices and significantly boosting their production in order to make a go of it.

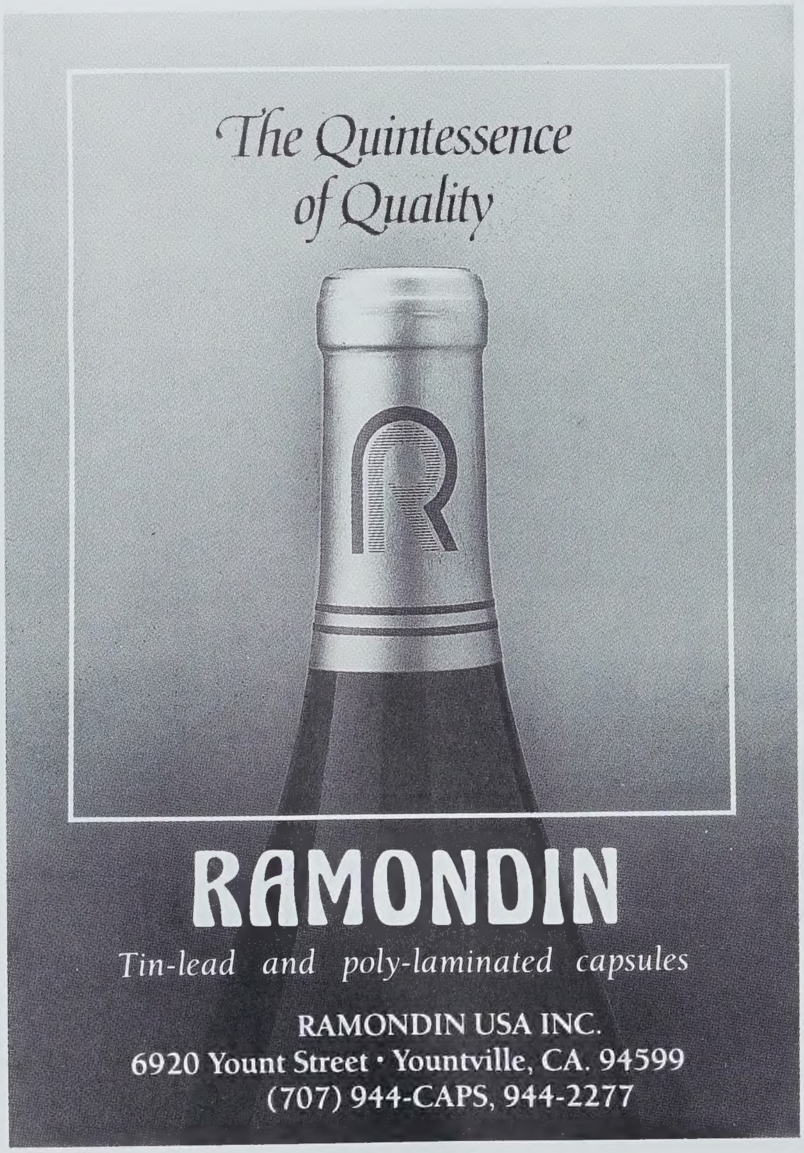
Knowing that Cartidge's parents were leaders in the Communist-led British trade union movement, it is ironic that his vision of the wine industry's future sounds so much like a Marxist description of capital accumulation, Napa Valley style.

“We're going to have a situation where there are a few large wineries, making 75,000–500,000 cases/year of good Napa Chardonnay and selling it for $8–$9/bottle. They'll be supported also by tourism and the sale of a few other varieties like Cabernet Sauvignon and Sauvignon Blanc. It won't be as romantic as it used to be—and only those small producers whose product is demonstrably superior will survive—but some sensible businesses will emerge.”

Cartlidge's case for sounding the death knell of the small winery may be overstated, but there are certainly precedents—the automobile industry at the turn of the century being a notable one—and it is undeniable that economies of small wineries are suffering from severe pressures they were not designed to handle.

Clearly, the prices for both Chardonnay grapes and bottled wine must come down from the artificially high plateau established during a short-lived and illusory condition of scarcity. In every respect—production, pricing, marketing—the grower and producer must realize that they're playing in a new ballgame.

As Tony Cartlidge sums it up, “The love affair is over; we're into the marriage now.”



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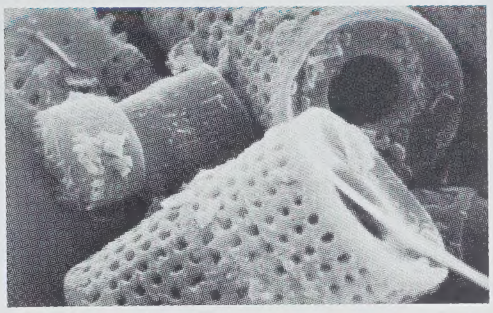

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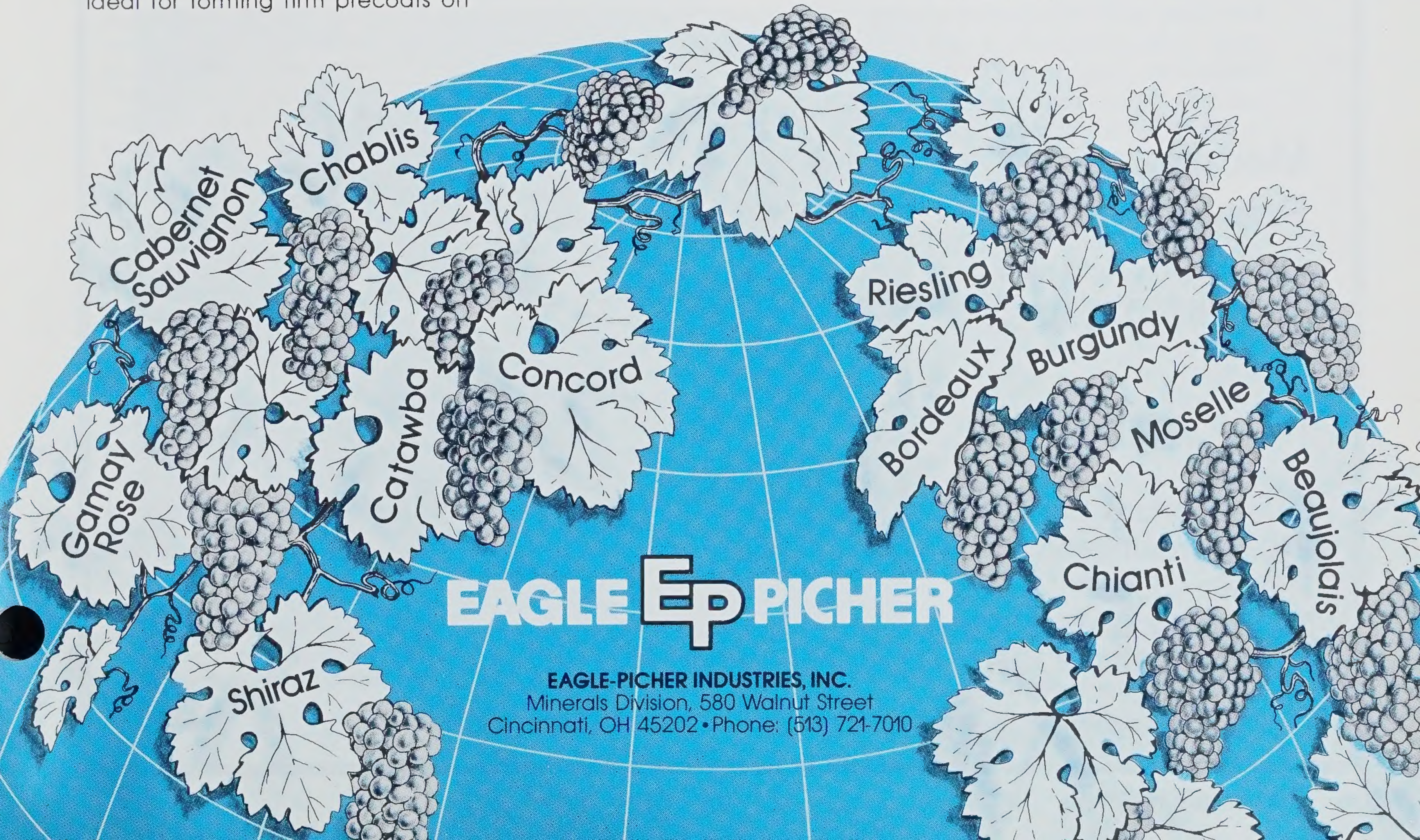

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In The Cellar

Jake Lorenzo

Editor's note: It is an oft-heard comment that this guy Jake Lorenzo must be using something pretty strong to come up with this stuff. I personally have never seen the man into anything heavier than wine (allowing, of course, for the occasional tequila bender). I think Jake is like this naturally. Either that or he's from a different planet.

Readers: to support Jake's proposal of providing winemaking and viticultural information in Spanish in his Jan/Feb 1986 column, please send checks made to "Marcelo Hernandez Honorary Chair" c/o Matanzas Creek Winery, PO Box 9083, Santa Rosa, CA 95405.

Don Novello wrote a book when he wasn't being Father Guido Sarducci. Entitled *Blade,* the book is a typical high school annual purportedly from Schellville High School. (Schellville is the low-rent district southwest of Carneros.) Don's book is unique in that every student, teacher and administrator is a sheep.

Don's sheep are individuals. Each has a distinct personality, from the goofy Larry 'Bummer' Brannon to vivacious Sandy Grubb to the sexy Taggart twins. Don's sheep have varied interests from the French Club to the Low Riders' Club to the Sky Diving Club.

Alas, Don's book is fiction.

Sheep are not bright and they don't have distinct personalities; they wander aimlessly in flocks. Sheep don't have varied interests; they graze. No one considers it a compliment to be called a 'leader among sheep'.

I know, you're asking, "Jake, what have you got against sheep?"

"Absolutely nothing," I answer, "in their proper place, which, as I see it, is on the table, roasted, preferably with a big chewy Cabernet."

Speaking of tables, look what comes to ours.

America is the most bountiful country on this planet. Her abundant harvest provides a panoply of foods and flavors that staggers the imagination. Food producers in this nation have the capabilities to electrify our tastebud with exquisite and exotic delights.

Yet the American marketeer (a leader among sheep) insists on reducing this cornucopia of flavors to a mishmash of inoffensive goo designed to please the least of all distinguishing palates. They then spend billions of dollars in advertising to attract the sheep and entice them to spend their hard-earned dollars on these compromised foodstuffs.

So who's to blame? Not the marketeer. He's just out to make a few bucks, to generate some business, to provide a few jobs. Surely not the sheep. Their job is to graze and maybe get a haircut once a year so we can have fancy clothes. No, they're not to blame.

In fact, this column has nothing to do with blame, nothing at all. This column's about sheep, remember?

I'll tell you what I like about sheep: they don't do drugs.

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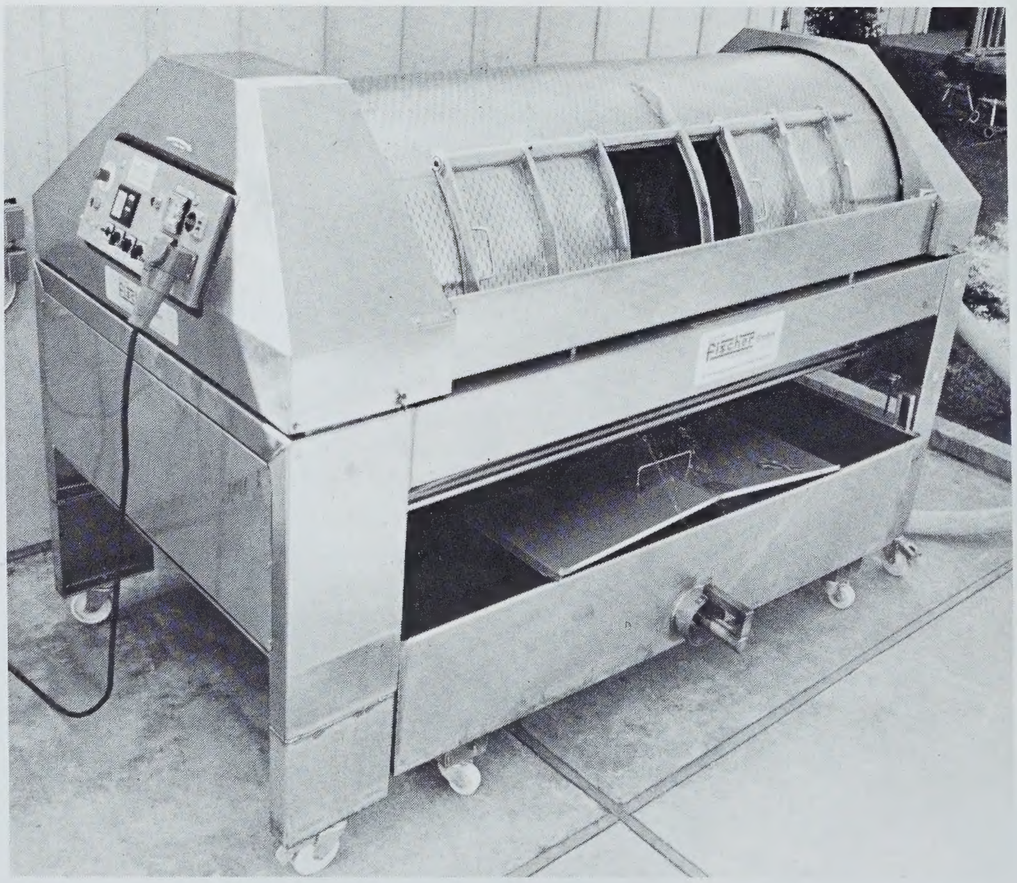

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That's right. When was the last time you saw a sheep with dilated pupils from toking on one too many a joint? Ever see a sheep with a runny nose from too much cocaine? I'd be willing to bet there's never been a sheep hooked on heroin.

People, on the other hand, are developing quite a reputation for being addicts. We can get addicted to anything from drugs to TV to religion to health food. Addiction is so common a human condition that nowadays certain addictions are fashionable.

Alas, this is fact.

Addicts think a little bit won't hurt them; it will. Addicts always think they can quit; they can't. Addicts always think they're in control; they're not. No one wants to admit he's an addict.

"Jake," you cry, " what's wrong with wine coolers?"

"Jake, what have you got against white Zinfandel?"

"Absolutely nothing," I answer again, "in their proper place, which, as I see it, is in the grocery market, in the bulk wine section, where the greedy American marketeers have sold it to the sheep who think they need to buy it."

The most pervasive American addiction today is *not* drugs, or alcohol or violence. Today's America is addicted to mediocrity. It affects everyone and has permeated every thread of our American fiber.

Like all addictions, mediocrity is insidious. No one sets out to be mediocre. On the contrary, we start with the highest of intentions. You know, maybe you're going to produce the finest, most intense red wine mankind has ever had the pleasure of sampling.

And you do it. You've produced the world's great red wine, but it doesn't sell. You start to doubt yourself. Could you be wrong? *No.* Certainly not, so like other addicts, we put the blame for our addiction on outside forces. You know, the reviewers think the alcohol's too high, the restaurateurs think the tannin's too harsh, the retailer thinks the label's too drab. All of which leads you to that first (how shall we say it?) compromise.

You know, just a little can't hurt. You'll just pick the grapes a little sooner, fine the wine a little heavier, do the packaging a little prettier. But just to improve the cash flow a little so you can go back to your goal of making, uh, really good . . . uh, good-tasting . . . uh, wine.

Remember, addicts, the first one's free. Just a little bit can't hurt. You're not selling out, just compromising a little. You know, the critics still don't like your wine. It lacks character, they say, but to hell with the critics. It's starting to sell, and you can get some lousy Zinfandel cheap, and blush wines are in, so you'll just make what the sheep want and you'll be rich, which is almost as good as making great red wine. At least you'll be able to buy it if someone else makes it.

I don't blame you. This is not about blame. It's not about sheep anymore either.

Jake Lorenzo wants to thank those of you who resist. Bless you for resisting the compromise. Power to you for believing in your convictions and pursuing your dreams. We're not all sheep, and while I can't guarantee it, I think there's enough of us out here to support you and keep you going.

And God bless those who refuse to be sheep, who seek out and support the committed, dedicated producers of the world.

Anyone can be a hero. Anyone can resist. No less a star than Bill Cosby said, "I don't know the key to success, but the key to failure is trying to please everybody."

I'll tell you one thing. I'm rooting for that guy Herb. I hope Burger King never finds him. I want him to know if he ever shows up here, I'm taking him to Chuy's Burrito Palace for some real home-cooked food. And I'm paying, too.

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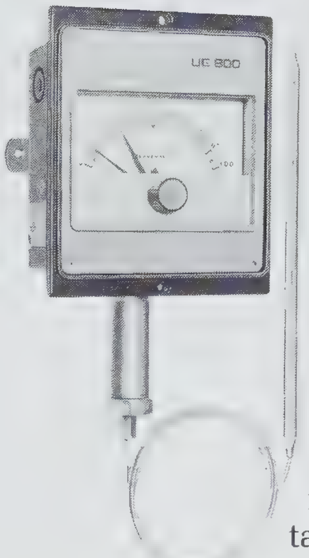

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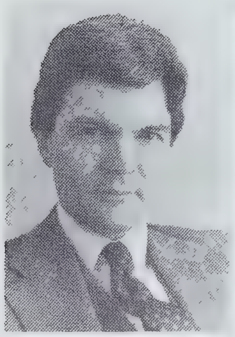

The Wine Lawyer

R. Corbin Houchins

Ingredient Labeling Yet Again

Like an opera with too many acts, the ingredient labeling story is on stage again.

History

Efforts to require disclosure of ingredients began in the early 1970s at a time when the exclusive power of BATF to control wine labeling was under attack by consumer groups.

Since the cession of labeling turf by the Food and Drug Administration to the Department of the Treasury was based on a discretionary administrative decision in the 1930s and not made more formal than a delegation letter, there was some fear that wine would have to comply fully with FDA regulations. Labeling under FDA regulations would both require ingredient disclosure and impose other restrictions not found in the Treasury restrictions promulgated by the Bureau of Alcohol, Tobacco and Firearms.

It is probable that the original proposal was made in order to show that BATF was as concerned about consumers as FDA, and possibly to counter Bert Lance's placement of BATF on the list of agencies deemed expendable by the Office of Management and the Budget, but the proposed regulations (as so often happens) acquired momentum of their own. Their vitality persisted after the FDA delegation letter had been upheld in court and after public scrutiny of certain Georgia banking practices had taken Mr. Lance out of the game.

Consumer Indifference

In 1975 the director of BATF was making speeches about helping the consumer by ingredient labeling.

By 1976 it had become apparent that consumers were not highly interested in the subject; attendance at hearings was pretty much confined to industry members and organizations that purported to speak for the absent wine drinkers. That year BATF delayed implementation from 1977 to 1983.

The Crusade

Then came the Reagan administration, promising to get government off the backs of people, presumably including winemakers.

By 1978 an executive order required that all new regulations be analyzed for economic impact. Although ingredient labeling had been around too long to be considered new, BATF did an economic analysis anyway and, further, contracted with private firms (at taxpayer expense, of course) for a poll on whether people thought ingredient labeling a good thing (in-

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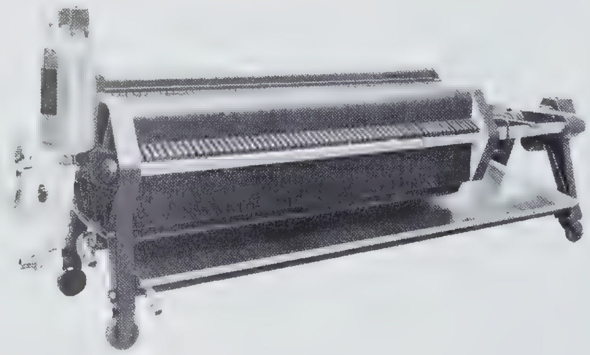

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conclusive) and for a cost-benefit study (also inconclusive).

The final form of the ingredient labeling regulations was published in 1980, with an optional disclosure-by-mail feature that was designed to 'minimize costs to the industry'. By the following year that labor of the BATF staff had been set naught, as the government elected to rescind the proposal on the grounds that the cost to industry exceeded the benefit to consumers.

One for the Saracens

At that point the Center for Science in the Public Interest sued the Department of the Treasury, alleging that the rescission was arbitrary and capricious.

The Center won in the District Court, which evidently failed to share the philosophy of the government reduction crusaders. In March 1983, complying with an order of the court, BATF reinstated the regulations with a new effective date of February 8, 1984. The government also appealed the District Court decision to the Court of Appeals and simultaneously gave further study to the need for ingredient labeling.

Flanking Maneuver

On October 6, 1983, while the appeal was still pending, the government concluded that there was no need for ingredient labeling and rescinded the regulation again.

The Court of Appeals dismissed the appeal as moot with respect to the part of the District Court order which required the setting of a new effective date and did not review the part which found the BATF action to be arbitrary and capricious. The effect was to put The Center back to square one, requiring a new suit on the propriety of the latest rescission.

Counterthrust

The Center's second action was heard by the District court in 1985, and by a decision rendered 30 October 1985 the court came to the same conclusion, which is essentially that cost to the industry may not be the determining factor in regulatory decisions affecting public health.

Those still with the plot by this time may wonder whether we are in for a series of hearings around the country, giving the thus-far-invisible consumer support for the regulations a chance to appear. The answer is no. The District court, possibly miffed by cavalier disregard of its first opinion, simply put the clock back. If the new order had not been stayed by the Court of Appeals last November, BATF would have had to announce a new effective date for the *1980 version* of the regulations, which new date could have been not later than 30 April 1986.

What Next?

Probably the case will be appealed again.

The Justice Department has filed a notice of appeal and has obtained an order from the Court of Appeals, which is the next stop in the appellate process, staying the order while an appeal is heard. As of this writing (mid-January 1986), the government had not completed the further procedures required to get the case heard, but the intention appears to be to carry through with the appeal. That course of action would seem necessary in order to vindicate the fundamental Reagan Revolution thesis that the administration can repeal regulations for lack of cost-effectiveness.

As long as the trial court order is stayed, BATF is under no obligation to proceed with ingredient labeling. Moreover, the agency is still operating under a continuing budget resolution that forbids it to spend any money to implement ingredient labeling until there has been a final appellate decision.

Even if the stay were lifted by abandonment or loss of the appeal, there is nothing in the order that would prevent BATF from amending the proposed regulations substantially after

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announcing a new effective date or from deciding on more cogent grounds than before to ditch ingredient labeling again. However, there are many staff people at BATF who believe that ingredient labeling is desirable, and government lawyers would probably not want to risk judicial ire by acting on a narrow reading of the order. Thus, it looks as if the regulation will become effective if the appeal does not result in reversal of the trial court.

Since we all may have to deal with ingredient labeling in 1986, it is worth looking at some features of the 1980 proposal applicable to U.S.-produced standard table wine.

Summary of the Current Proposal

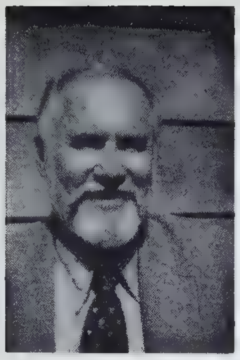
The main points of the proposal ordered reinstated by the court are:

1. The disclosure required is not really of ingredients (which are too difficult to define and describe in a mixture as complex as wine), but of 'essential components' in the production process. Thus, both 'grapes' and 'yeast' must appear on the list, although neither is an ingredient of table wine and the latter is normally entirely removed. (Organic winemakers will be relieved to learn that a wine fermented entirely with wild yeast clinging to the bloom could list only 'grapes'.)
2. Sulphur dioxide and other additives are to be listed, but statements of function (such as 'to preserve' or 'to stabilize') are optional. The package may not list any additive that is not present in the wine.
3. Processing aids, such as fining agents, that are added to remove other substances and are not present in the finished product in 'significant' amounts generally do not have to be listed. Other processing aids are deemed additives and must be listed if they remain in the wine.
4. Substances used to correct deficiencies by bringing the must or wine up to normal specifications generally do not have to be listed, if they are identical to the missing amount of the natural substance.
5. The list must be introduced by the word 'Ingredients'. Lists apppearing on the package may not be buried in other label copy and must be set in at least 1mm letter height.
6. Items do not have to be listed in order of predominance, so long as the statement 'not necessarily in order of predominance' accompanies the list.
7. The list does not have to appear on the package at all, so long as the front of the package conspicuously bears the statement, 'For information about the ingredients in this product (*or* wine), write:', followed by the complete address of the producer or bottler (including ZIP code). Timely response to consumer enquiries by furnishing the list is required; BATF has said that a reply within 30 days would be timely. 'Sell copy' on a label that could be misconstrued as an ingredient list precludes use of the mail option. Unlike lists on the package, a mail-in list may identify any additive that may or may not be present, using phrases such as 'may be present'. Alternatives may be listed with 'or'.

Conclusions of the Moment

It does not seem necessary to saddle up for ingredient labeling at this time.

Good manufacturing practice and the cellar records already required by BATF are doubtless sufficient for any foreseeable ingredient labeling requirements. Note, however, that the grandfather clause of the 1980 version exempted only wine in the bottle as of the effective date, not bulk wine on hand, so the 'components', 'processing aids' and 'additives' of some wines now in cooperage may be subject to disclosure if there is indeed an ingredient labeling regulation in our future.



Winery, Water & Waste

D.R. Storm, Ph.D., P.E.

Management of Small Pond Systems

Wineries are often faced with a difficult decision on the care of small ponds, where the balance between 'natural' and 'sterile, but attractive' is difficult to achieve. Whether it is an irrigation re-regulating pond, a wastewater polishing lagoon, or an aquatic feature that is part of the winery landscaping, all will require periodic attention and a gentle touch to make them both attractive and functional.

Dynamic Equilibrium

A previous column discussed the general nature and functioning of ponds used for wastewater treatment (*PW,* Vol.V, No.6, Mar/Apr 1985). All aquatic systems, whether part of the winery's wastewater complex, vineyard irrigation storage, or landscaping, have elements which are common to each other. Each pond system is trying to achieve some level of dynamic equilibrium, in which the various parts of the biologic network are in some sort of balance.

For example, one pond component that frequently becomes a problem is the number of species of suspended photosynthetic plankton (algae). Plankton 'blooms' occur because of biostimulation of some sort from a) an augmented nutrient supply, b) a weather change (more sunlight and higher temperatures), or c) the die-off of plankton grazers (zooplankton).

Another characteristic of ponds (and their larger cousins, lakes) is their tendency to 'age'. The ageing process is called *eutrophication* by limnologists (physical and biological scientists who study lake processes). The relative 'richness' of a pond or lake can be directly related to its so-called 'primary productivity', or the production of photosynthetic plankton or algae. This lowest link in the food chain for water bodies determines to a great extent how many (density) and what kind (diversification of species) of aquatic organisms that a given pond can support.

An example of a large aquatic system that is *not* highly productive is Lake Tahoe on the Nevada-California border; however, its nearly crystal-clear water is carefully protected for its aesthetic values in lieu of a 'greener' but more highly productive lake. In this example, man has intervened to slow down the ageing process. Land use regulations and sensible watershed planning are the principal management tools by which this national water asset is being preserved. Maintaining a balanced system and monitoring pond geriatric processes is much simpler in a small pond of shallow depth and small volume, which is the category of water bodies generally found on winery property.

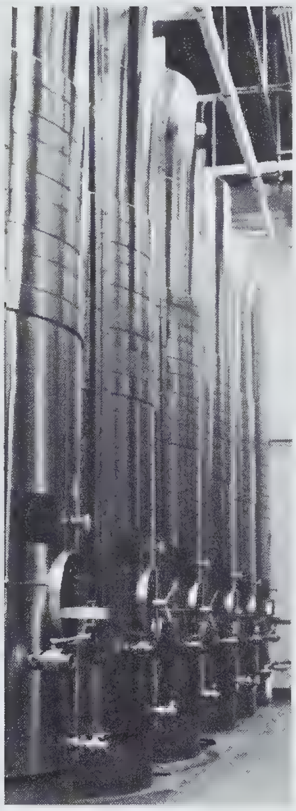
Algae

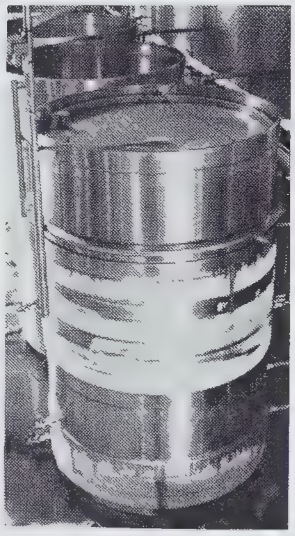
In any given pond, many factors control the presence and abundance of the planktonic (floating) community of microscopic plants called algae. In climates with severe winters and freezing temperatures, the production of algae is practically nil during cold periods. There are a number of other phyla (species with common ancestors) that can be included in the planktonic algae category, but from a pond management standpoint the ones that usually turn the pond into 'pea soup' are the green and blue-green algae. A 'bloom' of green and blue-green algae can present some problems:

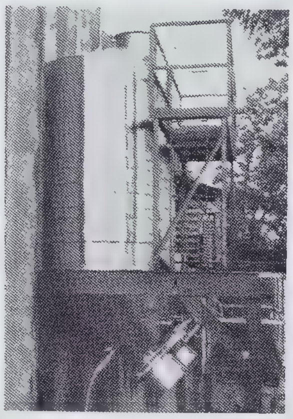
1) Algae produce oxygen during sunlight hours, but respire at night, frequently causing a diurnal dissolved oxygen sag, endangering other higher aquatic species such as finfish.

2) Algae eventually die and the large biomass sinks and begins decomposition, further placing stress on the dissolved oxygen supply. (The resulting odors from anaerobic decomposition of algae on the pond bottom can require remedial action. See *PW,* Vol.VI, No.5.)

The many factors that control algal ecology will be different for each pond, in each climatic zone, and for a given pond depth and hydraulic throughput.







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The least complex algae control mechanism that can be used by wineries is copper sulfate ($CuSO_4$). The salts are relatively inexpensive and can be applied by placing 10–15 pounds of $CuSO_4$ in a burlap sack or nylon net bag and towing the array behind a rowboat (or a trained duck or goose) until the pond has been totally traversed. As with any chemical treatment, it is best to approach the application on a conservative basis, making another cycle with the $CuSO_4$ until the 'bloom' appears to lose its vigor and the water returns to its pre-bloom color.

Over-applying the copper compound can wreak havoc on fish, including the tough little mosquito fish that are often introduced into ponds for aquatic insect larvae predation. There may be other more imaginative methods of applying the copper; however, there is danger of applying too much. My experience with 'more is better' philosophy involved a small marine tidal basin which lost its entire system of flora and fauna, and the copper remained in the bottom sediments for about two years. The owners overshot the target concentration with a broadcast of $CuSO_4$ at about 100 lbs/acre.

Commercial algicides, such as those used in the control of swimming pools, are sub-classified by the type of algae that inhabit a given swimming pool environment. Because of the chlorine residue in swimming pools, which tend to discourage algae, the concentration of copper or ammonium chloride-based algicides is probably too low for pond use (about 4–10% copper [greens] and copper plus ammonium chloride at 25% for other species). The cost of packaged, target-specific algicides might also be prohibitive. Also check with the county farm adviser in your particular area—they may have some tricks for algae control in farm ponds that will fit your situation perfectly.

Aquatic Weeds

The weeds of greatest nuisance interest in small ponds are in 'floating', 'emergent', and 'submerged' categories. Cattails, tules, and bullrushes are the most common emergent varieties, while pondweed, waterweed, and water milfoil are the submerged types most often creating problems in western U.S. ponds (Pers. Comm. 1986). Floating genera which can become pests are duckweed (greater and lesser), water hyacinth, and water fern (Ibid. 1986).

Floating weeds can literally be skimmed and harvested, if they get out of hand. Ducks do make duckweed part of their diet, but experience has not demonstrated a balance between duck preference for grazing duckweed and the rate at which it can reproduce (Ibid. 1986). Commercial herbicides are available for the control of all the aquatic weed types, but as with the copper algicide, caution should be used and advice obtained on when to apply the compounds for best results.

If your winery laboratory has a copy of *Standard Methods for the Examination of Water and Wastewater,* the pictorial section and key to major groups of aquatic organisms will help you to identify the plant that is trying to take over your pond. The book also has many color plates of other aquatic organisms that are pond dwellers.

Nuisance Insects

Aquatic insects usually spend only part of their life cycles in a pond. It is during that period that they can provide food for higher aquatic forms, such as fish, and to a limited extent wetland birds. Gnats and mosquitoes are most often thought of as the pests you could just as soon do without. Their control in the aquatic stage can be as simple as wave action at the time of emergence. (If they can't dry their wings in a quiescent sector near the shore, the young adults can get washed back into the pond and never make it to the flying stage). Mosquito fish (*Gambusia sp.*), given the right population for a given pond, can be a very effective biological control for mosquitoes. Gnats, on the other hand, at 1,500/square inch of pond substrate, can require other methods of control.

Every sector of the U.S. has its own special problems with gnats and mosquitoes. Mosquito Abatement Districts do a pretty good job of controlling the pests, although the hundreds of thousands of acres of rice fields north of my home in Davis, California, produce an astonishing population of the trouble-

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some devils that seem to defy any economic means of control. The drying of the rice fields before harvest and the first north winds of fall can bring a horde of hungry mosquitoes looking for fresh hemoglobin that is truly impressive. (I tend to eat a lot of garlic during that short season, and I really think it wards off the little buzzers.)

Turbidity, Color, and Dissolved Oxygen

High turbidity in most ponds is usually short-lived and accompanies a rainfall and suspended sediment input from a related watershed source. The same runoff can also bring with it a slug of dissolved chemical nutrients and organic matter in the form of leaves and organic ground litter that can eventually decompose in the pond and exert a further nutrient loading on the system. In a pinch, if pond aesthetics are really an important issue for your strategically located landscape feature, the addition of a small quantity of powdered alum (aluminum sulfate) to the pond can augment the natural sedimentation and clarification that takes anywhere from hours to days to occur.

The amount of alum to apply can be roughly determined by making a simple 'jar test' and adding the alum in increments until a relatively rapid clarification occurs. The alum is harmless to the aquatic flora and fauna and will remain part of the bottom sediments until resuspended or physically removed by dredging. (Incidentally, dredging *is* one solution to the pond ageing or eutrophication that was discussed previously—if the pond gets too shallow from entrapment of organic and inorganic material, a dredging program might be just the thing to rejuvenate an elderly pond.)

Color from leaf pigments can also be adsorbed on the coagulated alum nuclei. Color is usually not a problem unless the leaf and organic litter inputs to the pond are very large.

In most of the pond processes above the bottom zone, dissolved oxygen (D.O.) plays a major role in overall pond health. The role of algae in the D.O. balance was discussed previously. If D.O. is not maintained at 5 mg/L and above, many fish species cannot survive. Artificial aeration by the introduction of compressed air, by spraying the pond water in the air, or by frequent changes of pond water with inflow high in D.O. can all work to maintain proper levels.

Ducks, Turtles, and Other Pond Denizens

The mammalian and reptilian inhabitants of a pond seldom become a problem, although I have been chased from a pond by what appeared to be, at the time, a man-eating 'guard-goose'. Achieving balance in other aquatic populations is best accomplished by trial and error and by understanding the role of each in the interwoven pond network of food and habitat.

David Storm is a consulting sanitary engineer and owner of Winters Winery, Winters, CA.

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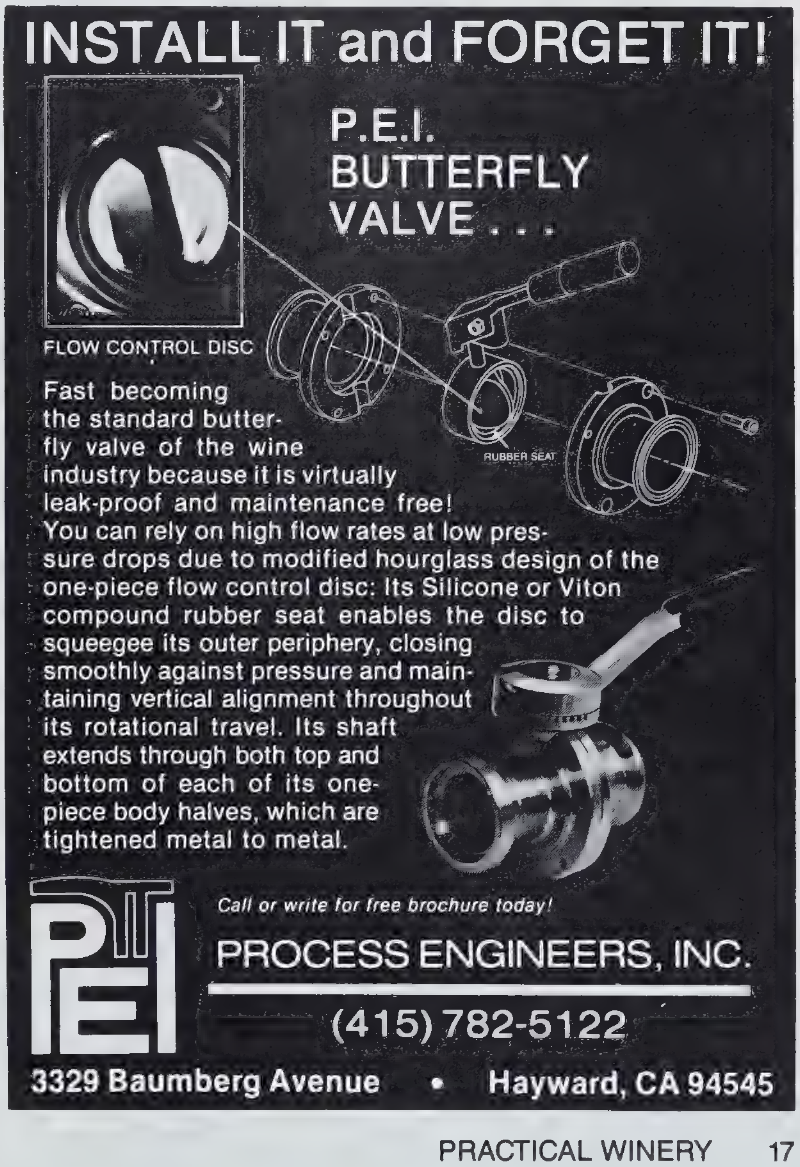
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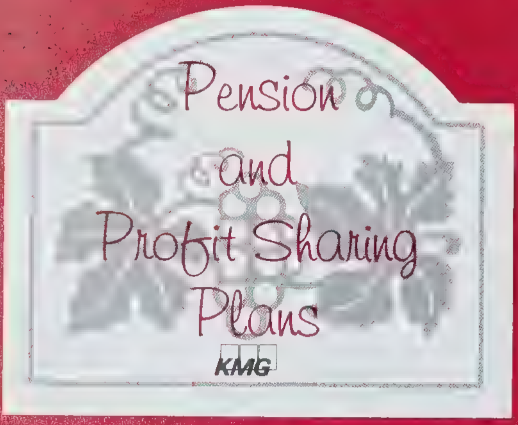
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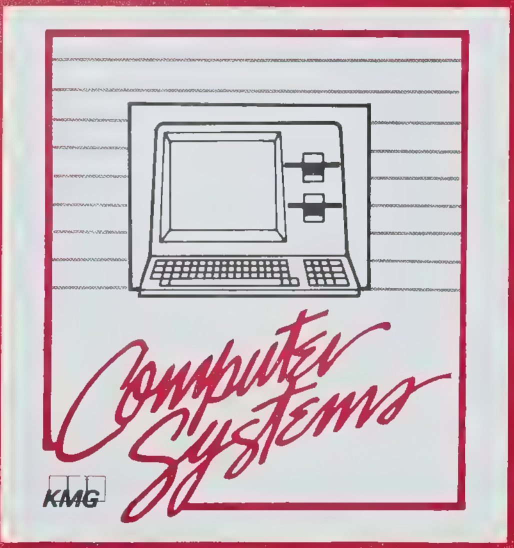

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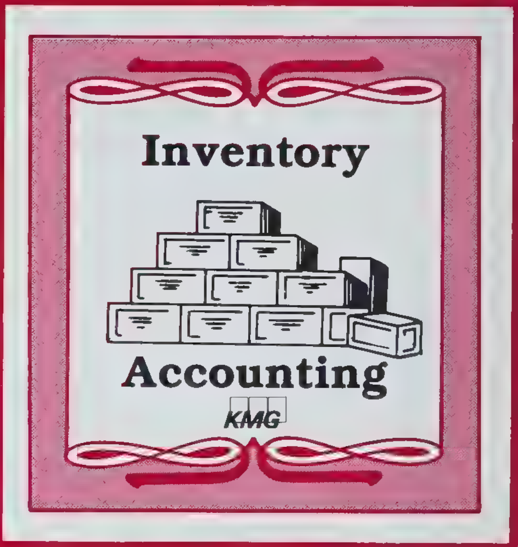

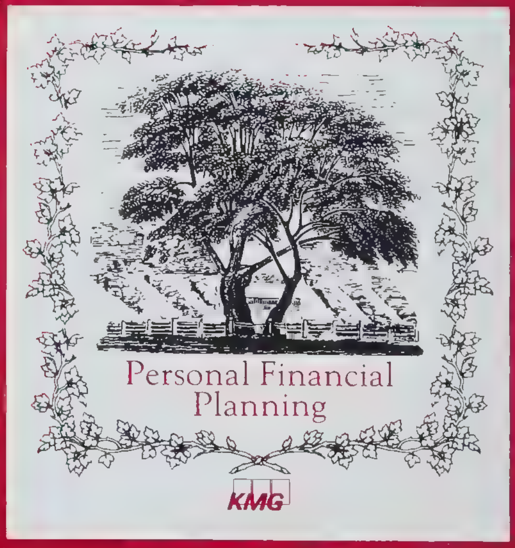

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Making Credible Financial Forecasts

Albert E. Peters, Partner
KMG Main Hurdman, Oakland, CA

Today, a winery often needs to provide investors and other parties vitally interested in its success not only with a look at past performance through historical financial statements but also management's future outlook in the form of prospective financial statements. Prepared properly, prospective financial statements should assist the winery in formulating and achieving its own long-term goals.

However, if done unrealistically, such statements may not only undermine management's credibility with outside readers, but also may lead to management's establishing unachievable financial goals and ultimately to the winery's failure.

The American Institute of Certified Public Accountants (AICPA) has recently published a guide setting forth standards for prospective financial statements, including financial forecasts and projections. In this release, the only permissible prospective financial statement for general use (where the user is unable to ask a company directly about presentation questions) is the financial forecast. A financial forecast should present, to the best of a company's knowledge and belief, its expected financial results. It should be based on the company's assumptions as to the most likely conditions and courses of action.

Financial forecasts differ from financial projections in that projections reflect results from asking the question "What would happen if . . ." and, accordingly, are not bound by the constraint of the forecast, which presents the *most likely* financial outcome. Unlike financial forecasts, projections should be limited in distribution to outsiders who are negotiating directly with the company.

Wineries preparing prospective financial statements should now follow the AICPA's release, even though it is not effective until September 1986. Accordingly, let us look at what might be expected in the way of assumptions for a forecast.

Significant assumptions made in assembly of forecasts must be set forth in the presentation. A summary of significant assumptions begins with certain generalized assertions, as follows:

1. The statements reflect management's judgment, based on present circumstances, of the most likely set of conditions and management's most likely course of action.

2. Some assumptions will inevitably not materialize and unexpected events and circumstances may occur.

3. Therefore, actual results will vary from forecasted results and the variations may be material.

Next, for both forecasts and projections, there are required disclosures relative to the entity and its accounting methods. These include the form of organization, basis of accounting (accrual, cash, etc.), and a summary of significant accounting policies.

Finally, as appropriate, operational assumptions relating to the following areas need to be disclosed. These assumptions should be those which management believes are significant to the forecast or projection and are key factors upon which the financial results of the enterprise depend.

For a winery, these assumptions could consist of:

1. Annual Production Level
   - Grapes grown
   - Grapes purchased
   - Gallons of bulk wine produced and/or sold
   - Cases bottled
2. Revenue and Expenses
   - A. Anticipated sales by product type
     - Price per case
     - Cases sold for wholesale, retail and tasting room
   - B. Cost of sales by product type
     - Raw material, processing, bottling and warehousing costs/case, including maturation assumptions
   - C. Selling and general and administrative, such as commission rates and percentage of direct labor assumed for fringe benefits
3. Anticipated Annual Facility and Equipment Additions
   - Vineyards
   - Cellar and storage
   - Other
4. Financing
   - Borrowings
   - Payout schedules
   - Interest rates
5. Income Tax Assumptions
   - Tax rates
   - Tax transaction treatments
6. Capital Contributions
   - Units or shares sold and dollars raised
7. Unusual or Infrequently Occurring Items
   - Sale of a facility or line of business

EXHIBIT A: MYTHICAL WINERY – SELECTED ASSUMPTIONS

	Historical		Forecasted			
	1984	1985	1986	1987	1988	1989
Tons Crushed	170	420	670	1,000	1,340	1,340
Cases Produced	10,000	25,000	40,000	60,000	80,000	80,000
Cases Sold	–	5,000	10,000	25,000	40,000	60,000
Average Retail Bottle Price	$12.00	$12.00	$12.50	$13.00	$13.50	$14.00
Operating Receipts	$ –	$ 360,000	$ 750,000	$1,950,000	$3,240,000	$5,040,000
Operating Expenditures	500,000	730,000	975,000	1,625,000	2,320,000	3,270,000
Operating Cash	$(500,000)	$(370,000)	$(225,000)	$ 325,000	$ $920,000	$1,770,000

For forecasts, responsibilities of management and CPAs do not end with the preparation of the statement and summary of significant forecast assumptions. It is not enough to establish assumptions and then 'let the chips fall where they may'. Instead, prior to issuance, the winery's management, including the preparer of the forecast, must critically evaluate the forecasted results in light of the assumptions made.

Once the forecast is released to the general public, readers of the financial information will undoubtedly begin to evaluate the reasonableness of the assumptions and the achievability of the forecast; and then, only if they believe the forecast is realistic, will they place confidence in winery management.

The preparer of forecast information should address a series of questions to evaluate forecasted results and modify its assumptions until the forecast appears achievable. In order to focus on the type of questions that should be asked, Exhibit A presents some selected assumptions and results for Mythical Winery. Let us now ask six questions of Mythical Winery.

1. Is the forecast consistent with what is happening in the marketplace?

For example, the exhibit indicates that Mythical Winery will achieve positive operating cash in its fourth year in existence. Do actual experiences in the wine industry validate the reasonableness of this result?

2. Does the forecast have a realistic time period?

Is it realistic to expect Mythical Winery to go from zero to sales of 60,000 cases in five years? Or should the time period be longer?

3. Is the forecast internally consistent?

For example, does winery capacity equal or exceed planned production? Mythical Winery shows production of 295,000 cases and sales of 140,000 cases from inception to 1989. Facility costs must therefore include the capacity to store 155,000 cases at the end of 1989. Also, is it practical to have 155,000 cases on hand in 1989, which represents approximately 2 ½ years of product at the 1989 rate of sales?

4. Is the strategy appropriate to the winery's resources?

Will the winery become too highly leveraged?

Is an adequate positive working capital position maintained throughout the forecast period?

Will a lending institution view the forecast as achievable?

Mythical Winery will have a cumulative deficit of $1,095,000 in operating cash after the end of the third year. How realistic are the plans to finance this operating cash deficit?

5. Is the strategy workable?

Does the winery have the right people to achieve the forecast? For example, does the winery have the technical expertise to produce the wine and execute a marketing plan to achieve the sales forecast?

Does the winery have the financing commitments in place?

6. Is the risk appropriate?

What is the cost of failure if you do not meet your forecasted sales by 10%? by 25%?

Do you have an adequate cash flow if your sales prices are not maintained?

In Mythical Winery, prices are forecast to increase each year by $.50/bottle. If the average sales price is reduced 20% per case and held stable throughout the forecast period, the Mythical Winery would receive $3,204,000 less in cash. Would the winery survive such a pricing structure?

Only if management can answer the foregoing questions positively can the forecast meet the requirement that it represent management's most likely course of action and the most likely outcome.

Credible financial statements are the upshot of much effort to realistically establish assumptions and evaluate results. Most sensitive to outside influence are factors such as consumer acceptability, interest rates and grape prices. In-house statements often need to be prepared on various assumptions until a definitive statement meets the criteria of management's best judgment of the expected results and, accordingly, represents a product worthy of general distribution.

Al Peters is a tax partner in the Oakland office of KMG Main Hurdman and currently directs the audits and reviews of many northern California wineries. He co-authored the series 'Accounting for the Wine Industry', and also teaches 'Accounting and Increase Tax Aspects of Wineries and Vineyards' at the University of California, Berkeley.

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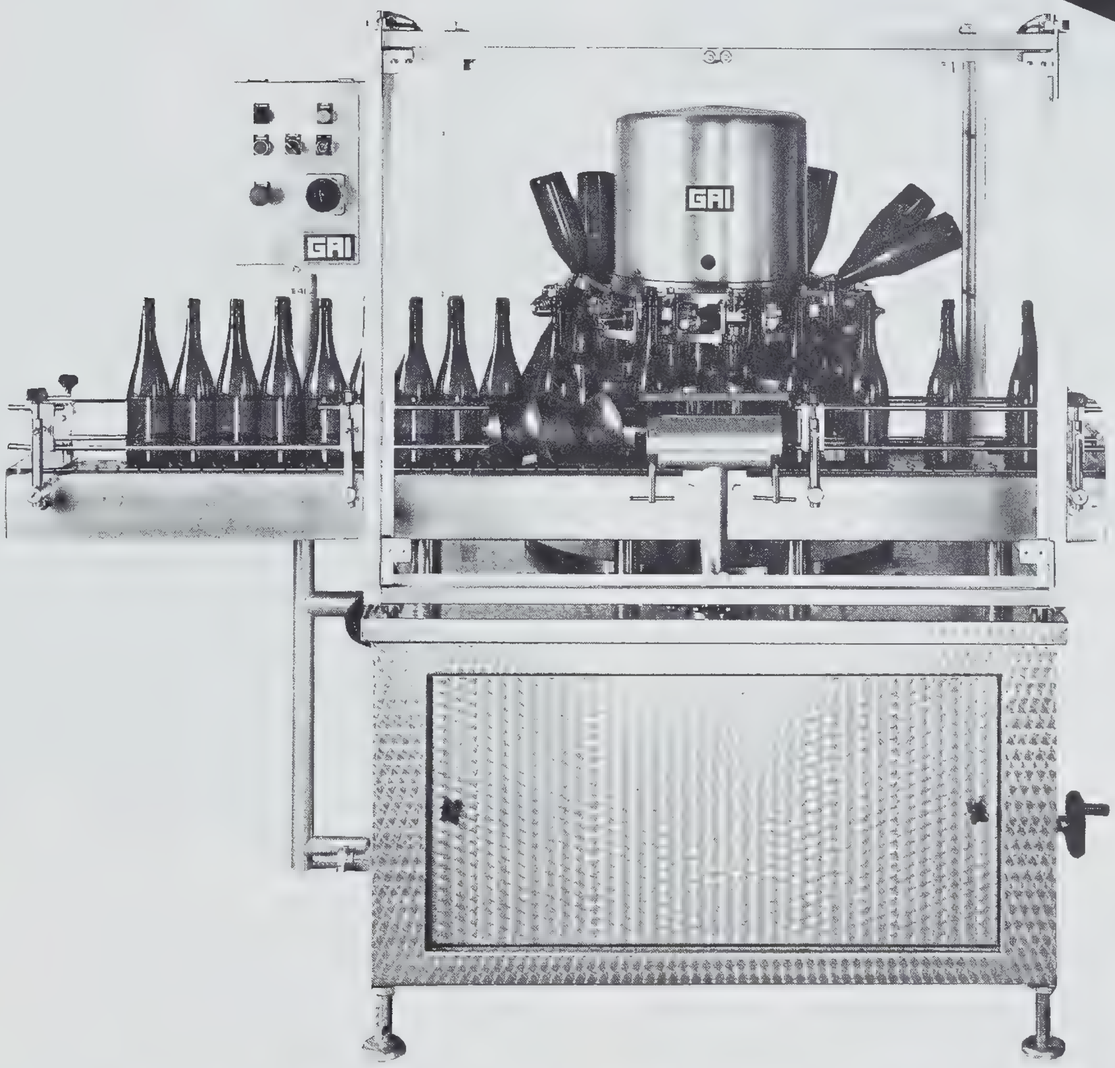

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Successful Trellising at Callaway

Ralph B. Hutchinson

John Moramarco, vineyard manager and senior vice-president at Callaway Vineyard & Winery in Temecula, CA, has developed a system of split-trellising of vines to accommodate the growing conditions and vigorous growth in their southwestern Riverside County location. In essence, the system differs little from the Geneva Double Curtain (GDC) which is widely used in eastern U.S. vineyards for trellising native American varieties, particularly Concord grapes. The principal distinction is that basic GDC vines are generally trained to bilateral cordons, whereas Moramarco has trained vines to quadrilateral cordons.

After Moramarco learned of split-trellises and saw examples of such in experimental vineyards at UC Davis in 1975, he began testing 'Wishbone' trellising, as he called it, at Callaway and subsequently converted all of Callaway's existing vineyard, including 40 acres of Chenin blanc, 40 acres of Sauvignon blanc and 20 acres of Chardonnay. When additional acreage was planted in 1981, split-trellising was employed.

The original vines, planted in 1969, grew more vigorously than expected and were subject to a high incidence of mold and rot as a consequence of the humidity which prevails during the growing season. Moramarco estimates that 40–60% of the crop was lost to mold and rot during some vintages in the early years of the vineyard, 1974-79.

Temecula is located 23 miles inland from the Pacific Ocean and Callaway Vineyard is separated from the ocean only by a range of low hills near the coastline. Throughout the growing season, strong on-shore flows of moist air over and through these hills are common. Wind, reaching a velocity of 12–15 knots/hour, comes up between 11:00 am and 1:00 pm almost daily and persists until sunset.

Ocean breezes blow from southwest to northeast across the region, drawn by the increased temperatures of the warm weather around Palm Springs and Indio to the northeast of Temecula. Callaway's vineyard (at 1,400-foot elevation) lies directly in the path of these winds and is cooled by them.

According to Moramarco, Callaway's vineyard is as much as 10–15°F cooler than areas north and south of the vineyard when these winds are flowing over them. However, the winds also increase humidity as a consequence of their moisture content, causing the relatively high incidence of mold and rot in the vineyard in certain years.

Moramarco shows shoot positioning at leaf-out.

Moramarco saw in a split-trellising system the possibility of opening vines to solar exposure and to better movement of air within the vines, thus reducing crop damage and loss. In 1978, Moramarco began experimenting with quadrilateral cordons on the 'Wishbone' support system. At first, only six rows of 150 vines/row of Chenin blanc (which had experienced the most

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severe problems with and greatest losses from mold and rot) were converted from bilateral cordons.

Conversion of the entire Chenin blanc block followed. Evaluations of the effects of conversion of that variety to the 'new' system revealed a 50% reduction in crop loss to mold and rot, providing incentive to convert the Sauvignon blanc, which had been cane-pruned. Crop losses of White Riesling were also reduced by approximately 50%. 173 new acres planted at Callaway in 1981 were trained to quadrilateral cordon on split-trellises.

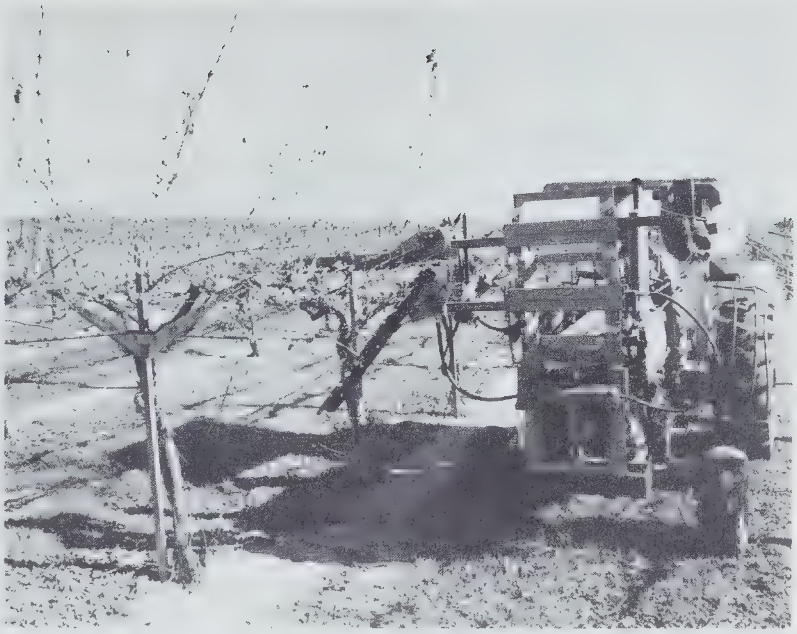
Moramarco's 'Wishbone' system consists of two trellis wires supported at the tips of brackets attached to posts five feet high. The posts are located at the end of each row and at every other vine. At every second vine, the trellis wires are attached to 2-inch x 4-inch crossarms supported on the 3-inch diameter posts. Vine spacing is 8x12, which means a distance of 16 feet between brackets, for trellis wires. The five-foot posts are two feet into the ground and vines have one trunk with four cordons four feet in length. The cordons and fruit zone are between 52–60 inches in height from the ground.

The initial metal brackets, manufactured by Wolverine, Philadephia, PA, have a shallow 'V'-shape, which suggested the term 'Wishbone'. The tips of the brackets are 38 inches apart and five feet high. Each cordon is secured along one of the trellis wires so that the two cordons on one side of a vine grow in opposite directions along the wire on that side of the vine.

One mower-equipped tractor can hedge 8–10 acres of split-trellised vines per day, making final pruning easier. Cuttings by pruners and hedger are swept to center of rows (which are not cultivated) and mowed for mulch. This has maintained a balance with nature such that insecticide has only been required in three of the last 16 years.

According to Moramarco, not only has the installation of quadrilateral cordons or 'Wishbone' trellising resulted in reduction of mold and rot by 50%, this technique also appears to have resulted in lower pH values and increased yields. Prior to the conversion, pH values were generally 3.4 or 3.5 and subsequently are 3.3 or 3.2.

Yields initially declined as a consequence of the conversion, but have now increased by 1–1.5 tons/acre. Moramarco attributes increased production to the increase in leaf surface exposed to sunlight. "For example," he says, "where vines are trained to bilateral cordons, 75% of their leaves are in shade, but where vines are trained to quadrilateral cordons, 75–80% of the leaves are in sun." Current yields are 6.5 tons/acre for Chenin blanc, 5 tons/acre for Sauvignon blanc and 4.5 tons/acre for Chardonnay, which was grafted over from White Riesling in 1980.



Mechanical pruner at work in Callaway Vineyard.

Although not specific to 'Wishbone' trellising, Moramarco's pruning system may also be of interest. Shortly before pruning, vines are hedged mechanically (in late November and early December) by a two-blade mower attached to the front of a tractor. This mechanical hedging, made possible by the split-trellising system, removes most of the brush, leaving canes approximately 12–14 inches long. Hedging cost is $9.00/acre and overall costs of pruning and hedging have been reduced by approximately 25% (over their cost prior to conversion) as a consequence of being able to hedge the vines mechanically prior to hand pruning.

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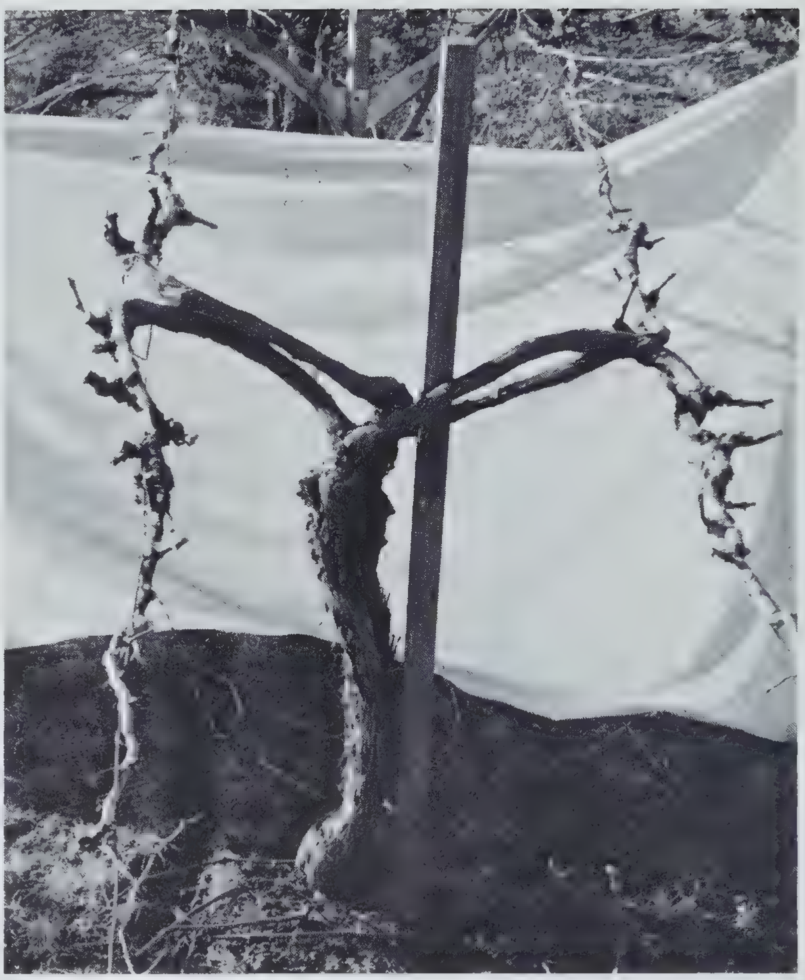
After final pruning, which is essentially the same for all varietals at Callaway, each cordon is left with 5 or 6 two-node spurs for a total of 20–24 spurs/vine–10 or 12 on each side. Distance between spurs is 5 or 6 inches, allowing ample room for fruit to hang.

The combination of split-trellising and hedging makes work in the Callaway vineyard easier than prior to conversion. Cordons are more accessible for pruning, suckering and tying. At harvest, the height of the fruit, 4.5–5 feet from the ground, at the same height as the cordons and support wires, makes hand-picking easier. As a consequence, higher quality fruit and fewer leaves go into picking receptacles than with alternative systems of training and trellising, according to Moramarco.

The 'Wishbone' trellising system has reduced the amount of work necessary to care for the vines during the growing season. Shoot positioning is virtually unnecessary during the growing season, and the only thinning required is 'suckering' and removal of fruiting shoots which will not develop properly and fully. Most vine training is accomplished during pruning. The vineyard has received three Bayleton sprays in each of the last three growing seasons; at 12 inches of shoot growth, followed at 30 days, and a final spray 30 days thereafter.

Moramarco acknowledges that he expected conversion on Sauvignon blanc to reduce the natural vigor of this variety, but the increased leaf surface exposed to sunlight has actually increased vigor. This has required greater care in controlling the amount of water which the Sauvignon blanc vines receive and in the number of fruiting spurs left after final pruning.

However, increased vigor of the Sauvignon blanc vines has not resulted in development of vegetative character in the wines. Callaway makes both a Sauvignon Blanc and a Fumé Blanc (the Fumé is drier and more austere) and neither has ever exhibited a pronounced vegetative nose or taste.



Pruned "Wishbone" vine at Callaway Vineyard.

When the 'Wishbone' system was adopted at Callaway, winery executives decided that mechanical harvesting would not be employed. New development of single row harvesters by French and Italian manufacturers makes mechanical harvesting of split-trellised grapes possible. However, Callaway executives have expressed a preference for hand-harvesting over machine-harvesting. "Human labor can be trained to leave undesirable fruit–whether unripe or moldy–on the vine;" says Moramarco, "whereas mechanical pickers cannot discriminate between desirable and undesirable fruit."

Conversion of the established, original Callaway vineyard involved costs of $1,000/acre, which has been offset by higher yields and higher quality fruit, and greater ease of harvesting and pruning. Moramarco believes that the yields which have already increased by 1–1.5 tons/acre can further increase by ½ ton/acre. Not only do the grapes have lower pH, but the pruning and trellising system makes it easier for pickers to select only ripe, sound fruit.

Conversion cost included $800/acre for metal Wolverine crossarms and $200/acre for labor to install the crossarms and move the trellis wires to the tips of the metal 'V'. Moramarco estimates that the cost of installation of the 'Wishbone' system in a new vineyard would be 10–25% less than the costs of converting an existing vineyard. The actual difference in costs will depend upon the type of system from which conversion is made and upon terrain of the vineyard.

At Callaway, the terrain is a series of rolling hills, some of which are 15° and some of which are relatively gentle. Direction of vineyard rows was determined by terrain rather than wind direction or sunlight. Rows were planted in the direction which permitted the greatest length possible for each row, in order to reduce the number of turns a tractor must make when hedging or when pulling a gondola through the vineyard at harvest.

Costs of establishing a split-trellising system can be further

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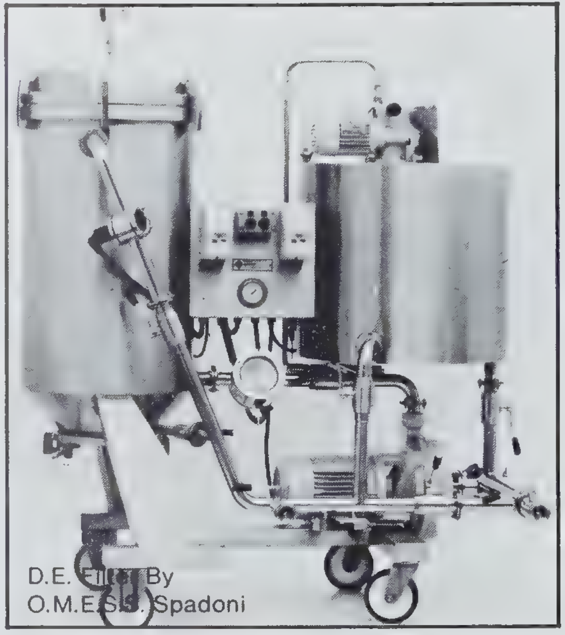

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reduced by use of wooden cross bars (2-inch × 4-inch) to spread trellis wires 48 inches apart instead of the metal crossarms. When Callaway added 173 acres in 1981, installation of wooden cross bars instead of metal crossarms resulted in an estimated total savings of $33,000, or nearly $250/acre. Although the trellis is 'T'- rather than 'V'-shaped, vines are trained into quadrilateral cordons and the cordons are trellised along wire supports stretched between the cross arms as are the vines converted earlier to 'Wishbone'.

In the vineyard block of Chenin blanc equipped with drip irrigation, mold and rot did not develop. It was also during the 1985 growing season that Callaway first experienced sunburn of fruit in the vineyard. However, only Sauvignon blanc was affected and only 6–8% of the crop was lost during a season in which the harvest was compressed into only 10 days. Moramarco concludes that 1985 was unusual and that split-trellising appears not to have increased the incidence of sunburn in Callaway's vineyard. The irrigation was cut back to reduce canopy but there was too little and sunburn resulted. The irrigation will be fine-tuned to achieve the proper canopy in the future.

Moramarco shows position of fruit on trellis at 52-60 inches from ground level near harvest.

Callaway Winery at top of rolling vineyards in Temecula, CA.

Conversion to quadrilateral cordons on split-trellises has not significantly shortened the length of time required for grapes to ripen to maturity in Callaway's vineyard. The typical number of days from bloom to harvest at Callaway is 100-110. Increasing leaf surface exposed to direct solar radiation may account for increased yields, but has not shortened the bloom to harvest period.

The results achieved thus far in Callaway's vineyard should be encouraging to vineyardists in other districts with humidity and mold problems. They may wish to explore the desirability of quadrilateral cordons or split-trellises in their own vineyards—or they may wish to experiment with rootstocks which reduce vine vigor as a possible alternative.

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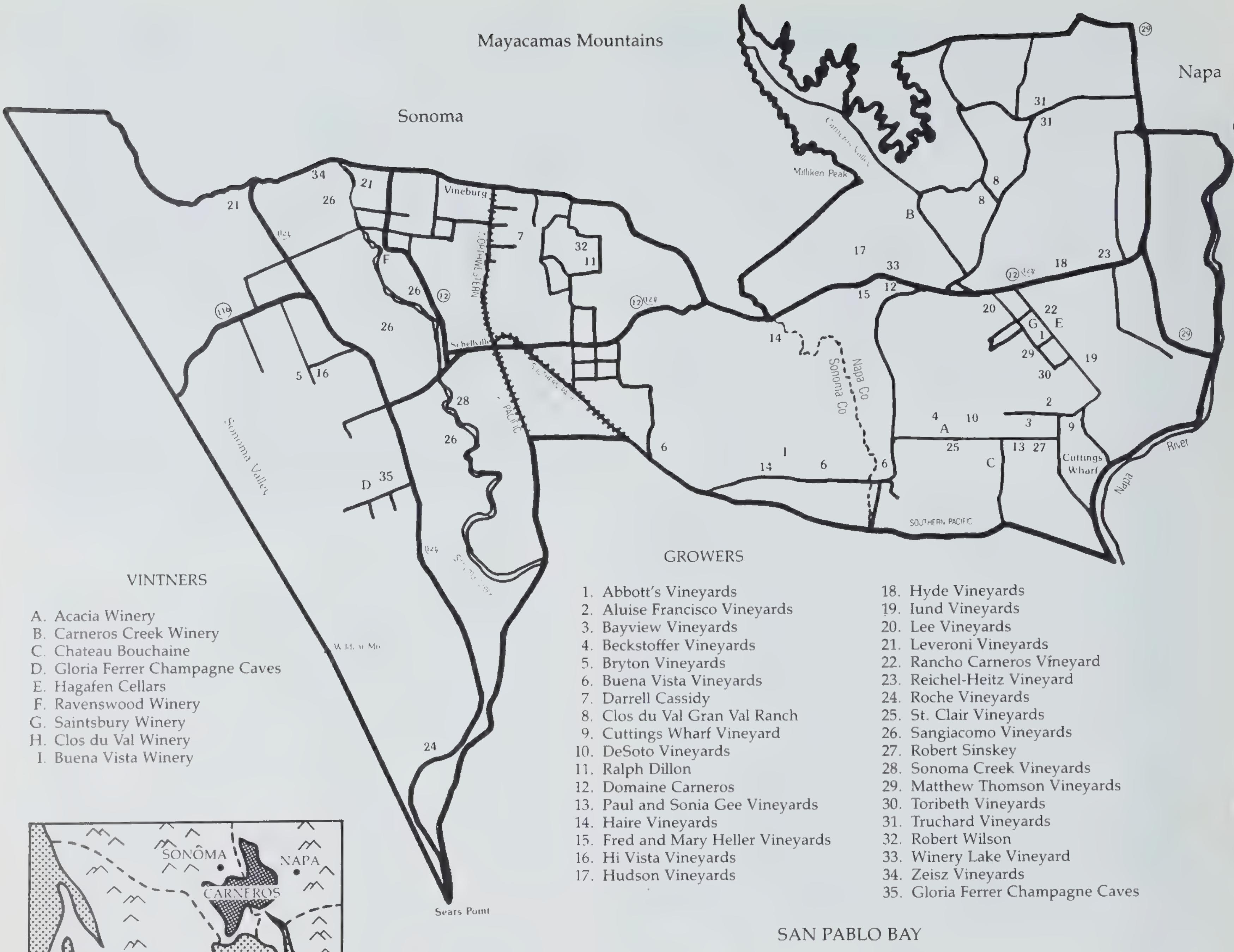

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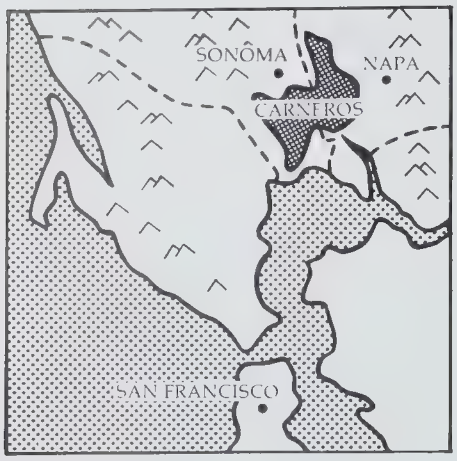

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Unique Conditions Spur Carneros Expansion

Los Carneros viticultural district in California has seen significant vineyard expansion in the last three years. Recently-recognized potential of unique grapegrowing conditions in the district has provided incentive for independent growers and wineries to add new vineyards or expand existing acreage.

Los Carneros, located between the Mayacamas Mountains and the marshes of San Pablo Bay and extending across the southern part of Napa and Sonoma counties, received official viticultural appellation status in 1983 due to its distinct climate and soil conditions. The Carneros appellation covers a total of 36,900 acres, of which 5,785 are currently planted to vineyard. Much of this acreage represents plantings since 1983. Approximately 70 growers have plantings among the dairy and cattle ranches and farms. In 1984, Los Carneros produced 11,172 tons of grapes, a yield of less than two tons/acre.

Major vineyard expansion has included adding more Chardonnay and Pinot noir acreage (these are the varieties which for the last 50 years have been considered to do especially well in this region); adding varieties other than Chardonnay and Pinot noir (especially Cabernet Sauvignon and Sauvignon blanc) to see how well they respond to climate and soil conditions in Los Carneros; vineyard spacing experiments; and clonal experiments, particulartly with Pinot noir.

The bottom line in any vineyard expansion is the demand on the part of wineries for more grapes from a particular region, presumably because those grapes produce a high-quality wine with a unique and recognizable character. This is certainly true of wines produced from Carneros grapes, which are gaining widespread acceptance among consumers, wine critics, and wine competition judges.

Because of the special qualities of the wines produced from Carneros grapes, they are in demand by more wineries in greater amounts than ever before, thus leading to the recent vineyard expansion. What causes the unique properties of Carneros grapes?

"Grape quality is more consistent and more consistently good in Los Carneros," states Eileen Crane, winemaker for Gloria Ferrer Champagne Caves in Sonoma County, explaining why she purchased 150 tons of Carneros grapes in 1985. This purchase comprised 25% of her crush. "The proximity of San Pablo Bay, which forms the southern boundary of Los Carneros, provides a cooler climate for a longer growing season with more consistently moderate temperatures. There are no extremes of hot and cold as in other growing regions further inland. The longer growing season allows the grapes to reach a greater level of maturity before harvest." Crane estimates that she will increase the Carneros fraction of her 1986 crush to between 35 and 40%.

Temperatures in Los Carneros often result in a total of less than 2,500 degree days during the growing season, thus qualifying the district as Region I. Annual rainfall is about 20-25 inches. Wind and fog from San Pablo Bay are important influences on the climate. The wind usually comes up in the Carneros by midday to cool the fruit. The cool air of the Carneros colliding with warm inland air forms fog, which further cools the Carneros summer climate.

San Pablo Bay offsets summer heat during the growing season and fall. Conversely, in winter and spring, potentially cold temperatures are moderated by the bay's warmer water temperature, heating the surrounding air and land and holding off early frosts. Summer temperatures average about 6°F cooler near the bay than further inland and winter and spring temperatures are about 6-8°F warmer, thus allowing grapes to ripen slowly and mature fully over a longer growing season.

Major quality constituents of wine grapes are related to heat. A strong correlation exists between the levels of total acidity (tartanic and malic acids) and temperature. Both acids are present in roughly equal amounts at mid-season. As grapes mature, malic acid is degrades by enzymes. The rate at which malic acid is degraded, as well as the final malic acid quantity at harvest, is directly related to the temperature of the berries during maturation. High temperatures will respire malic acid necessary to maintaining crispness and fruitiness of a wine.

Soils in Los Carneros are equally important in determining consistent grape quality. Bale clay loam, Clear Lake clay, Cole silt loam, Diablo clay, Haire clay loam, Zamora silty clay loam, and Huichica loam exist in the region; Haire and Huichica predominate. Soils are shallow and vary from well-drained to marsh conditions. They have poor water penetration and experience excessive water runoff and erosion in winter. The subsoil in some locations is of a heavy, dark, organic mixture which can restrict root growth. All of this subjects the grapevine to more stress. Less vigorous vines produce less fruit that is smaller in size, with more intense varietal character, color and flavor.

Wine consultant Andre Tchelistcheff, who first crushed Carneros Pinot noir in 1938 says of the region: "Wines are not produced by the winemaker but by the vineyards. In the vineyards, everything is connected—climate, soil, soil depth, percolation of the soil, physical and chemical structure of the soil, topographical exposure of the plateaus where you're planting toward the sunlight, total summation of the temperature, humidity of the air, air movement, fresh air towards the vineyard block.

"The Carneros has unique climatic conditions—sparkling wine producers use Carneros fruit because of its freshness, acidity, and lower pH, which coincide with the breeze and lower temperatures. The breeze, with moisture from the bay, gives a wonderful growing condition and maturing of the fruit. You have a more normal physiological compostion of the fruit, in the juice. The fruit has a tendency to preserve more malic acid; and malic acid is an important factor in the fruitiness, the berriness of a wine. If you don't have malic acid, the grapes become flat, and you have to try to rebuild it artificially. What is in the berry is the wine. This is your future wine in the glass. That's what Carneros has, that ideal composition of the berry alone, the individual berry, in the cluster."

Because of these soil and climate conditions, Los Carneros has, for the last 50 years, been considered an ideal location for planting Chardonnay and Pinot noir. (Vineyards existed in the area in pre-Prohibition times, but were planted to then-popular varieties such as Tannat and Valdepenas. These vineyards were virtually destroyed by phylloxera and Prohibition.) Currently, Chardonnay accounts for 51% of total plantings in Los Carneros and Pinot noir accounts for 32%.

Tchelistcheff comments on Carneros Pinot noir: "To grow the great Pinot noirs, you have to locate a cooler climate with far more humidity in the air, and the gentle breeze to avoid the hot spell. Pinot noir has a very tender skin, and the berry is very susceptible to oxidation. When there are hot spells, the coloring substance in the grapes will give them a brown color. In cooler climates as in Carneros, the coloring substance is far more stable.

"Carneros Pinot Noirs are smooth, oily, round, and have that particular perfume that only Pinot noir grown in a cool region can give you, that almost animally aroma, which we say is 'leather-glovey'. Once they reach optimum maturity in the bottle, they become really glovey, just like new kid gloves. You can detect that. And that's a great privilege."

"Carneros Pinot Noir exhibits a definite 'Carneros character'," according to Francis Mahoney, owner/winemaker of Carneros Creek Winery in Napa County. "It shows a particularly velvety texture in the mouth with spicy, peppery flavors. It doesn't have the raisiny, plummy quality that can result from growing in too hot a location. And it is full-bodied, not thin, again due to the cooler climate in which it is grown.

"Different winemakers in Los Carneros are striving for variations of this style, they're all going in the same direction. Even the same type of cooperage—Burgundian—is used pretty generally throughout Carneros to create and maintain that Carneros style of Pinot noir."

"Carneros Chardonnay is very fresh," adds Tchelistcheff. "It reminds me of some outstanding Chablis of France rather than great Burgundies, because of the freshness of the fruit alone and its good acidity. That's not a deficiency; it's a class of wine that's far more drinkable than some very fat, rich, extremely alcoholic Chardonnay that some hot regions in California are producing."

Over 500 acres of Chardonnay and Pinot noir have been planted in Los Carneros since 1983. Buena Vista, Carneros Creek, Cuvaison, Domaine Chandon, Gloria Ferrer Champagne Caves, and Louis M. Martini are among wineries that account for this new acreage, while Hudson Vineyards and Truchard Vineyards are among Carneros growers with new plantings of these varieties.

Chardonnay and Pinot noir planted in the years just prior to 1983 have lately come into production, increasing the tonnage of Carneros grapes harvested in recent years. Sangiacomo Vineyards, a large grower on the Sonoma side of Los Carneros, contributed much to this recently-added tonnage from its 1982 and 1983 plantings of 250 acres. Wineries with added tonnage are Chateau Bouchaine, Cuvaison, Domaine Chandon, Louis M. Martini, and Sequoia Grove.

Among wineries who developed vineyards in the Carneros in the 1960s, Buena Vista recently acquired an additional 1,000 acres to become the largest winery landholder in the district. The winery, with an annual production of 100,000 cases, is situated in the midst of the original 700 acres.

Experiments are being done on the recent Chardonnay and Pinot noir plantings. Tony Truchard, owner of Truchard Vineyards on the Napa side of Los Carneros, is currently working on an experiment comparing 2-wire and 3-wire trellising on Chardonnay. All his Pinot noir is being converted to 'T' trellises with wires 18-20 inches apart to minimize wind damage.

Experimenting with clonal selection has led to expansion of Pinot noir acreage at Carneros Creek Winery. Mahoney states, "We started clonal research on Pinot noir in 1975 in an attempt to find the true Burgundian clone. We started with 20 different clones; currently, we've narrowed that down to six. Those six are now being planted to provide grapes for a commercial scale-up of the project and to determine subsequent wine quality.

"The six clones were chosen for the consistency of their attributes. Some have small berries and give a jammy, powerful, dark wine; others have larger berries and give a lighter, Gamay Beaujolais-style wine. But all of them have shown these attributes year after year. Blending during commercial scale-up will bring out the best of these attributes. These clones provide a good cross-representation of grapes that will produce fine Carneros Pinot Noir.

"Our original 10 acres of Pinot noir plantings were on 7x11 spacing; the 11 new acres, planted in 1985 and 1986, are on 3.5x11 and 5x11 spacing. We're experimenting with vineyard spacing with clonal selection, since a few of the clones we're working with are very low-yielding, producing an average of 1–1.5 tons/acre. So we will try planting more of them. As soon as we can find an economical way to farm it, we will plant 5.5x3.5 with certain clones. Quantity of vines will increase without loss in the quality of the wine."

Recent vineyard expansion in Los Carneros has included other varietals, notably Cabernet Sauvignon, Merlot, Cabernet franc, Sauvignon blanc, and Gewurztraminer. Tchelistcheff states: "I was one of the strongest opponents of planting Cabernet in the Carneros, because I had the proof of Louis Martini's experience, and my own experience, that out of 3 or 4 vintages only one was outstanding. The others were strictly mediocre, only suitable for a master blend, a huge cuvee, with wine from central Napa.

"But only three miles away, with 300 more degrees above what I had, I found sufficient proof that Carneros can, with certain plateau exposure to the south, such as Buena Vista's vineyards have, produce outstanding Cabernet with full maturity. Cabernet Sauvignon in the Carneros is a phenomenon, a miracle. Due to those 300 extra degrees and the degree of slope of planting, it's exposed all day to the warm sun and breeze coming together."

Truchard is one grower who is working with Carneros Cabernet Sauvignon, as well as varieties typically blended into Cabernet. His vineyard is uniquely suited to Cabernet, since it is situated at the warmer north end of Los Carneros on a southwest-facing, 200-300-foot knoll. A 1985 planting covers 45 acres, including 22 acres of Cabernet Sauvignon, 13 acres of Merlot, and 4 ½ of Cabernet franc. Already producing are Truchard's original 56 acres, which include 12 acres of Cabernet Sauvignon, 4 of Merlot, and 2 ½ of Cabernet franc. Further plantings in 1986 will cover 20 acres and will include about 50% Merlot. There remain 40-45 acres to be developed.

Buena Vista Winery, which encompasses portions of both the Napa and Sonoma sides of Los Carneros, also recognizes the potential of Cabernet Sauvignon in the area. Experimenting with this and other varietals accounts for much of Buena Vista's expansion in Los Carneros. Most of Buena Vista's current Cabernet Sauvignon plantings, which will cover 180 acres by the end of 1986, accounting for 18% of Buena Vista's total planted Carneros acreage of 847, is planted on the flat with deeper soils. However, the winery will add an experimental 18 hillside acres in 1986.

Richard Nagaoka, vineyard consultant to Buena Vista, discusses this experimental planting: "Two locations for Cabernet will produce very different styles of wine. From the hillside, with thinner soils, will come more concentrated wines. From the lower benches with deeper soils, we expect a softer, velvetier, maybe a more chocolatey style, thinner in body, lighter in color. If you blend, you get the benefit of both and have more options.

"Depth and water-holding capacity of the soil are important. Cabernet does well in shallow soil with a low water-holding capacity in a hillside vineyard, and in loam with clay underneath, which limits the root system. Clay holds a lot of water but does not necessarily give it up easily. The hills are almost steep enough so that some growers would put in terracing. There is enough experience now that lets us farm those vineyards without terracing. The rows run with the hill, up and down the slope, so we can keep the sod culture intact."

Anne Moller-Racke, Buena Vista's vineyard manager, adds, "In 1986 we will plant some Cabernet Sauvignon in gravelly soils—almost 40 acres. We will plant a total of 120 acres in 1986: Pinot noir, Riesling, and Merlot will be planted as well as Cabernet. We will also experiment with a few acres of Sauvignon blanc in a very carefully chosen location to see if it does at all well in the Carneros."

Larry Hyde, another Carneros grower who is expanding his acreage, has already discovered that Sauvignon blanc can, indeed, grow successfully in Los Carneros. "This year," says Hyde, "I'm adding 3 acres of Sauvignon blanc for a total of 18 acres of that varietal." This is over 15% of Hyde's total 115 planted acres. The original 15 acres of Sauvignon blanc were planted on AxR 1 rootstock on 6x11 spacing, using a 4-wire trellis system. The 3 new acres are planted on their own roots on the same spacing and trellising system. "The shallow soils and relatively cool temperatures of Los Carneros permit only a small Sauvignon blanc crop—about 4 ½ tons/acre—to be produced," Hyde points out.

"The result of this," he continues, "is that Carneros Sauvignon blanc produces smaller vines with a more open canopy so that more sunlight filters through. This seems to produce a more grapefruity, citrusy character, rather than the heavy vegetal quality of larger vines with a heavy canopy."

Nagaoka corroborates this: "Sauvignon blanc's potential vigor can be offset in shallower soils, producing a less active vine with less foliage, and creating a microclimate right around the cluster which will be warmer because of the better exposure. By doing this, Buena Vista expects to produce more of a melony, fig, banana flavor in the wine."

Other grape varieties recently planted in Los Carneros include Gewurztraminer, which Buena Vista will plant more of on hillsides in shallower soils. Merlot and Cabernet franc are now being planted by several vineyards primarily to blend into Cabernet Sauvignon, and Semillon is being planted for Sauvignon blanc blending. Domaine Chandon has recently planted about 25 acres of Pinot Meunier to use for sparkling wine blending experiments.

Vineyard expansion in Los Carneros has also involved spacing experiments by Domaine Chandon and Buena Vista. Because of the shallow soils of the Carneros, productivity is relatively low, about 2 ½ tons/acre on average. With closer vineyard spacing, growers hope to increase production without sacrificing quality.

Zach Berkowitz, vineyard manager for Domaine Chandon's Carneros Ranch, explains the evolution of their spacing experiments: "Our first plantings, in the 1970s, were on 6 ½x10 ¾ for 623 vines/acre. Plantings in 1982-84 were on 5x10 to accommodate mechanical harvesters. We have 270 acres planted on this spacing for 871 vines/acre. Our newest planting, 10 acres which we put in as an experiment in 1984, is planted 2mx 1⅓m for a total of 1,570 vines/acres. About half of our recent Carneros plantings is planted to Chardonnay, with the other half being Pinot. We'll check effects on vigor, productivity, and uniformity of the product. Also, we'll note how the tighter spacings affect canopy, microlimate, and grape quality."

Berkowitz believes the distance between rows is more important than the distance between vines: "By adding more rows/acre, by closer row spacing or by split trellises, we are increasing the number of feet of vine/acre. Now we can have more buds/acre, which should reduce vigor, or we can spread out the buds to improve exposure. Both scenarios improve microlimate, which should improve quality and yield. Spacing between vines is not as relevant."

Moller-Racke describes Buena Vista's vineyard spacing experiments: "In our first Carneros vineyards, everything was planted 8x12 because the land was flat and had the same type of soil. Now our planting will range from 5x10 to 8x10 because we will be developing many different soil types and terrains. Eighty acres are being planted in 1986 on 5x10, 6x10, 7x10, and 8x10 spacing. (Rows are 10 feet apart to accommodate mechanical harvesters.) Our purpose is to increase the crop, match the width of the vine to the spacing, and test for better canopy and grape quality. We want to increase productivity without compromising quality."

Jill Davis, Buena Vista winemaker, explains the importance of spacing that will allow for mechanical harvesters: "At Buena Vista, we mechanically harvest most of our fruit at night, when the temperature frequently goes as low as 50°F. The fruit doesn't sit in the hot sun in gondolas and is therefore fresher and goes into the fermenter at close to the temperature at which we ferment most of our wines."

Nagaoka believes that tighter spacing can help make up for the low productivity of Los Carneros' shallow soils: "One vineyard block has a more conservative planting with a moderately good soil depth, 2.5–3 feet, mostly loams. It appears to be a lighter-textured soil from aerial photos and soil tests. On the hillside, there's two feet and less in some cases. We won't get a very big vine, but we'll work with the variable of spacing."

What does all this expansion mean to the future of Los Carneros?

For one thing, it means the development of the Carneros Quality Alliance (CQA), a recently-formed group of Carneros-area growers and vintners dedicated to expanding consumer recognition of the Carneros appellation. With Mahoney as president, the group is planning educational tours and tastings across the country. The purpose is to emphasize the fact that the character and quality of wines produced from Carneros grapes are due to geographic boundaries, not political boundaries. The Carneros appellation is the first approved by the BATF solely on its unique microclimatic conditions, without regard to the border separating Napa and Sonoma counties.

Gloria Ferrer Champagne Caves in progress; 45,000-square-foot facility is being built at a cost of $5 million. Estimated total 1986 crush is 700-750 tons for 50,000 cases.

Members of the CQA are committed to keeping the county border out of any discussion of the Carneros, choosing instead to cooperate in sharing knowledge gained from the various vineyard experiments and promoting the region as a unique viticultural microclimate producing quality wines. Mahoney states, "The CQA is a collection of good people from Napa and Sonoma who share a common future vision of our area. It's ridiculous to talk in terms of Napa grapes or Sonoma grapes in Los Carneros. There is no difference in grape quality or character on either side of the border. The border is an artificial separation that the grape quality overcomes."

Current expansion will lead to future expansion in the area as more consumers become familiar with Carneros wines and create more demand for them. Plans for 1986 plantings are already underway at several Carneros wineries and vineyards, with some wineries, notably Domaine Chandon and Gloria Ferrer, already looking ahead to planting in the 1990s.

Above all, this expansion affirms Los Carneros as a major viticultural area, only recently being widely rediscovered.

* * *

__PRACTICAL WINERY__ would like to thank Buena Vista Winery, Sonoma, CA, which contributed much of the above information from its publication, __Carneros Chronicle__, VI:2, November 1985.

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Mondavi-Rothschild Employs Tight Spacing

"The character of the grapes from our new vines may create an entirely new potential for California wine; if so, we'll see a slow evolution that will eventually affect the entire industry," said Bob Mueller, head enologist for Robert Mondavi Winery, Oakville, CA.

Mueller was referring to the 18-acre Napa Valley vineyard of Baron Philippe de Rothschild and Robert Mondavi planted in 1985 for the Opus One joint winegrowing venture. The vineyard, located just south of the winery, has been planted on 6-foot row spacing, with 40 inches between each vine to total 2,180 vines/acre.

The remaining 23 adjoining acres will be planted as soon as the three European phylloxera-tolerant rootstocks—SO4, 110R, and 3309—that were chosen for experimental comparison are available. The joint venture also manages another 74 producing acres in two blocks in Oakville on 8x12 spacing.

Mondavi-Rothschild viticulturists believe this tighter spacing will result in higher-quality fruit than that produced via California's traditional 8x12 spacings. A couple of anticipated benefits are lower pH and a lower malic acid content at harvest. The tighter spacing is one of the three tools being used to control vigor. The other two are rootstocks and trellising.

The trellis system will consist of two wires to support the wood, one at 30 inches from ground level, the second at 36 inches from ground level. Two movable wires to support annual growth will be moved up the stakes at least twice during a season. A top wire will be at 72 inches above ground level. Each vine will have two canes and two replacement spurs. The canes will be pruned to 6 or 7 buds to achieve a total of 45,000 buds/acre. The goal is a canopy ratio of 0.68; that is, the canopy will fill up 68% of the row spacing.

85% of the joint-venture vineyard will be budded to Cabernet Sauvignon Selection 7, a heat-treated scion from the Federal Plant Management Service. This scion was chosed after winemaking trials from many vineyard samples. 10% will be budded to Cabernet franc and 5% to Merlot. A particular scion for Merlot has not been chosen and field selection may be used to provide the wood.

Tractor Innovations for Tight Row Spacing

As Mondavi-Rothschild viticulturists asked themselves how tightly spaced a California vineyard could go, one of the strongest limiting factors was the type of equipment available in the United States.

"In France, we could have chosen from among 10 or more tractor suppliers because of their tight spacing tradition, with vines grown on 1m x 1m spacing," said Freese. "Here, we went to our dealer, Mark Terrell, told him what type of workload the tractor would have to handle, and the maximum allowable width. Terrell had never let us down before, but we'd never given him this difficult an assignment."

Terrell, of Lincoln Farm Equipment, St. Helena, CA, calculated that the tractor's workload would require about 20 PTO horsepower; to find that much power, combined with a width of no more than 45 inches, would be difficult.

"Kubota is the best tractor available in the under-40-horsepower category," said Terrell. "The L235DT model tractor was close to the width requirement (49.4 inches from the outer edge of one rear tire to the other). The 4-wheel-drive model handles an impressive workload for its power (19 PTO horsepower). We all agreed that it was the best tractor for the job."

Modified Kubota tractor fits in narrow row spacing.

Modifying the Width

Terrell had his service department examine the front axle casting to see if it could be shortened enough to get the tractor within the 45-inch width. In addition, they changed the rear wheels and rear tires without affecting performance.

With approval from Robert Mondavi Winery, Terrell had a local machine shop cut 2.5 inches from each side of the front axle and shorten the front housing. The fenders were brought in the same amount, to maintain the operator's safety. Controls were also modified to assure ease of operation. The roll-over protective structure required no modification.

Another feature not usually found on a tractor in the under-20 PTO horsepower class is a manual shuttle shift. When the operator wants to change direction, he simply disengages the clutch, stops the tractor, moves the shuttle shift lever down to reverse in one straight motion and slowly releases the clutch pedal.

Terrel reports that Kubota currently offers several wheel models with different horsepower capacities that are under a width of 50 inches.

"Tight spacing requires tight maneuvers," said Ben Henry, Opus One vineyard supervisor. "These tractors get where they have to without damaging our vines. They're also easy to operate—and that makes a big difference."

Mondavi-Rothschild joint venture vineyard will determine potential advantages of tight spacing.

Wider vs. Tighter Spacing

The 8x12 spacing was designed by University of California professor Albert Winkler. This spacing design enables vines to become extremely hearty, and to establish substantial rootage; in fact, the root system currently in place in most 8x12 vineyards would preclude a grower from merely planting an extra vine or two in between those already planted. The new vines' roots would never have an opportunity to establish themselves.

Because a major reason for the tighter spacing is to induce less vigorous vines—which researchers believe will produce better fruit with a less vegetative quality—growers who eventually switch to tighter spacing would have to remove existing vines. Instead of continuing to profit from current vines, they would have to invest in new ones. To replant their vineyards, they would have to buy roughly 4.8 new vines to replace each of the old ones. The tighter spacing would pose another expense—the vineyards would no longer accommodate their tractors and implements.

"We have developed a vineyard in which cost of establishing the vineyards is not considered the most important factor," said Phil Freese, project research viticulturist and Robert Mondavi Winery's director of grower relations. "It will cost us about two or three times as much to produce fruit from the Opus One Vineyard as it would had we not tried the new spacing. But we believe that the quality will validate the expense."

However, growers thinking of replanting should consider not only the cost of removing and replacing vines, but of tractor and equipment modifications necessary to maneuver in tighter spacing.

Charlie Williams, the vineyard's general manager, estimates the five-year developmental cost, not including land acquisition, to be $42,000/acre. This includes preliminary drainage tiling and fumigation.

The Future

"There are many variables for each winery to consider in moving to tight vineyard spacing," said Mueller. "While superior quality is a main objective, cost will also be an important factor. For a grower to switch over acres of good vines in the anticipation of better ones in ten years may be folly. To survive in this business, you've got to be tenacious, earn a solid reputation and maintain a constant cash flow.

"A 30,000-case/year winery may be big enough to convert its vineyards over the course of a number of years. They could buy grapes from others while the new vines mature. But during the change-over, the quality of the wine could diminish, because of the possibility of lesser, or even different, grapes changing the nature of the winery's product. When the new vines are ready, the winery may be in financial trouble."

Mueller, who works not only for Mondavi but is also a partner and winemaker for Chateau Chevre, a small Napa Valley winery, expects both the very large and small wineries to take their time transforming their vineyards, should the joint venture vineyard experiment succeed.

"The large wineries are already competing with each other and the lower-priced European wines for a large segment of wine drinkers. Price will always remain important when someone buys a bottle of wine. The big wine producers will probably do their own experiments for their prestige or private reserve wines. But don't expect to see them rip out vines before they need replacement. It could take decades for the transition to be completed.

"On the other end, can the small winemaker, who has maybe a 5,000-case potential, afford to make the change? Some will plant new vineyard acreage tighter when they are able to expand. But the change will only be done when it is financially possible."

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Benefits of Leaf Removal—Part I

Mike Marcley

"The most serious disease facing North Coast vineyards in California is *Botrytis*," claims Jim Westfall, vineyard manager at Sonoma Cutrer Vineyards in Windsor. "In the early 1970s, if you got *Botrytis*, the thought was that you were doing something wrong. Now, with so many spores out there, it's a common problem that many people have come to live with."

Westfall manages 800 acres of vines that include 450 of Chardonnay and 40 of Sauvignon blanc on AxR 1 rootstock. He reduces *Botrytis* by using leaf removal (leafing) on 90% of his Chardonnay and in all other varieties except Cabernet Sauvignon, where he claims it isn't necessary.

"Our first and most striking results with leaf removal were in the Sauvignon blanc in 1982 (a big year for rot)," continues Westfall. "The vines are on a hill which gets plenty of wind, so it's the last place we expected to find bunch rot. The 10-year-old, cane-pruned vines are on 8x10 spacing in gravelly clay soil, so it was like a jungle in there by August, just before harvest, when we first noticed rot.

"We got in right away, cutting vines back with machetes and pulling leaves from around clusters. It was just like putting the brakes on; the rot stopped. We had opened up the canopies, providing air circulation so the bunches could dry out.

"Now we try to keep ahead of *Botrytis* by skirting the vines (cutting off drooping shoots about 30" above ground) and pulling leaves (about 4-5/shoot from around each cluster) in late June/early July, depending on the variety. We like to finish these operations before veraison."

Westfall noted that the increased cluster exposure due to leaf removal allowed for a reduction in the rate and amount of sprays and reduced picking times because there was less rot and the clusters were easier to see. The leaf removal also affected berry size and color, a result of lack of shade and increased sunlight exposure. "Our rows generally run NW–SE and the vines are cane-pruned," notes Westfall. "We usually only pull leaves on the SE side (to avoid sunburning fruit in the afternoon sun on the NW side) and I've noticed that clusters on the SE side produce smaller and yellower berries than clusters on the NW side. We are producing separate experimental wines from this fruit to see if there is a quality difference.

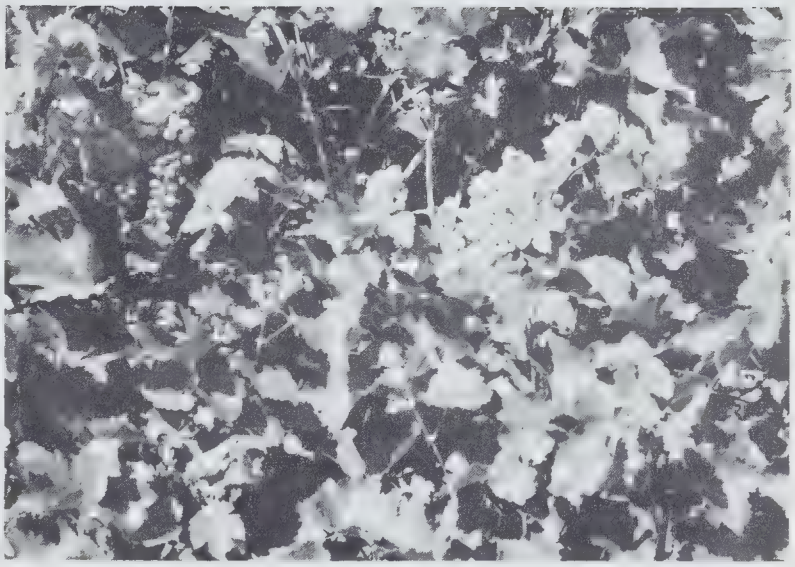

Figure 1

"In some cases, leaf removal can save the entire crop. We have 30 acres of Gewurztraminer and 60 acres of Chardonnay in a low-lying area by a creek where it is so foggy that water runs off vine leaves in the morning. We would have lost 1.5–2 tons/acre in the Gewurztraminer in 1985 if we hadn't pulled leaves. We crop-thin our Chardonnay to yield about 4–4.5 tons/acre, but would have lost at least one ton/acre (over $1,000/acre) if we hadn't pulled leaves on these vines in low-lying areas.

"In some of our vineyards, it can be a battle getting Chardonnay ripe enough for sparkling wine (typical harvest is 18-19° Brix and 0.9-1.0 TA). Without leaf removal, the grapes would rot off before they were ripe enough for still wine."

Leaf removal costs vary with variety and growing situation, but Westfall figured an average of $30/acre and added that in

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TABLE I
Effect of Canopy Manipulation and Spraying on Bunch Rot in Chenin blanc at Greenfield, CA

Treatment	% Rotten 1984	Clusters 1985	Weight of Rotten Berries/Vine (kg) 1984
Control	11.9	54.8	1.7
Hedging	14.2	46.7	2.0
Movable Wires	14.6	NA	1.6
Shoot Thinning	9.2	44.4	0.82
Leaf Removal (only)	1.8	25.6	0.25
Sprayed (only)	5.6	44.7	
Hedging + Spray	7.3	43.1	
Movable Wires + Spray	4.6	NA	
Shoot Thinning + Spray	2.0	49.1	
Leaf Removal + Spray	1.6	16.5	

some cases (small hillside vines in shallow soils) canopies are so small that cluster microclimate is naturally good and leaf removal isn't necessary. He explained that costs were low because he skirts the vines first and only removes leaves from one side of the rows. Even if costs were higher, he would continue the practice.

"I'm sold on leaf removal," Westfall asserted. "Even if it cost twice as much, I'd still do it because it reduces loss to bunch rot and spray costs. We began pulling leaves to improve spray penetration and coverage when we noticed that a lot of our spray was just running off the leaves and onto the ground while the clusters were dry. Now we get better coverage and I'm using less spray and there may be definite desirable quality differences in the wine."

Before retiring from the UC Davis Dept. of Viticulture and Enology, Amand Kasimatis, extension viticulturist, urged new members of the Plant Pathology Dept. to set up canopy manipulation trials. Dr. Doug Gubler, extension plant pathologist and Dr. Jim Marois, assistant professor of plant pathology, began trials in Wente's Chenin blanc in May 1984.

Treatments included one row each of hedging, movable foliage wires (for a vertical canopy), shoot removal (cordon suckering), leaf removal and control. Each row was split into a sprayed and a non-sprayed section. Larry Bettiga, Monterey County Farm Advisor, pointed out differences between the trials (mid-August 1985) and explained that leaf removal appeared to be most effective against bunch rot.

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Cluster exposure was better but there was some sunburning of fruit on the south sides of the rows. He explained that in 1985, leaf removal was done in June after fruit set. Leaves were removed from above, opposite and below each cluster.

"Hedging was also done in June, just before the pre-close spray to improve coverage," Bettiga added. "We used a grower-modified hedger and took off about one foot of growth on the sides and essentially tipped shoots that were upright. The horizontal blade of the hedger was set to cut at seven feet and the vertical blade was set to cut all shoots two feet away from the trellis. It wasn't necessary to hedge a second time because there was so little lateral development."

He emphasized the importance of timing for hedging, pointing out that in 1984, vines were hedged just after bloom, resulting in delayed maturity and more bunch rot than in the non-sprayed control plot due to an increase in canopy density from lateral shoot growth (Table 1). He suggested that a vertical trellis is best for hedging because upright shoots would then only be tipped and there would be less effect on maturity than with drooping (umbrella-shaped) canopies where shoots are not positioned vertically. In the latter case, many shoots grow outwards and hedging removes most of the shoot (in many cases leaving only 5-6 leaves/shoot to ripen the cluster).

TABLE II
Effect of Spray Timing and/or Leafing on Bunch Rot in Chenin blanc at Oakville, CA

Treatment	% Rotten Clusters 1985	% Rotten Berries per Diseased Cluster 1985
Control	30.5	3.3
Leafing (only)	6.2	0.3
Bloom Spray	29.0	5.0
Bloom Spray + Leafing	7.0	0.4
Pre-Close Spray	29.0	3.6
Pre-Close Spray + Leafing	4.0	0.14
Veraison Spray	47.5	7.5
Veraison Spray + Leafing	18.0	1.2
All 3 Sprays	20.7	3.0
All 3 Sprays + Leafing	5.0	0.27

"It's best to do shoot removal (cordon suckering) early (April) because spur shoots and their inflorescences are easy to see and the other shoots (water sprout) are much smaller and easy to remove," Bettiga added.

Results from the 1984 Greenfield trials indicated that leaf removal was most effective against rot (Table 1), Marwa reported. "There apparently wasn't any difference between the leaf-removal-plus-spraying and the leaf-removal-only treatments because there wasn't much rot in 1984. But in 1985 there was a lot of rot in Greenfield so the effect of each treatment was evident."

Marois explained that the spray (Rovral 2-lb/acre) was applied at 40% bloom, pre-close and veraison, adding that leaf removal had developed into a process of just removing leaves from around clusters. "We began by trying to remove basal leaves and leaves opposite and just above the clusters," said Marois, "but when you're in there (vine canopies) doing it, you just open up an area around the clusters."

He related that the university also had trials with Chenin blanc at Mondavi's Oak Knoll Vineyard using 1 ½-lb Benlate and 4-lb Captan/acre and leaf removal at just past set. "We hope to increase the number of trials in 1986 to determine the effect of spraying and leaf removal in many different growing conditions with the aim of reducing the amount of fungicide used in bunch rot control," Marois concluded.

According to Gubler, sprays at Oak Knoll were applied at either bloom, pre-close, veraison or all three times and were not any better at controlling bunch rot than leaf removal alone (Table II). He related that all clusters on treated vines were removed, counted (34 clusters/vine average) and assessed for rot. All berries on rotten clusters were removed, counted, assessed for rot (brown appearance) and the %rotten berries/cluster (disease severity) determined. "We also determined the total crop weight/vine (22 lb average)," he added.

Dave Heil, vineyard technical advisor at Robert Mondavi Winery, Oakville, CA, has supervised leaf removal and spray trials on 16 acres of Chenin blanc at the Oak Knoll Vineyard for two years. He noted that the vines are on AxR 1 in a clay-loam soil, spur-pruned and trained to bilateral cordon on a two-wire vertical trellis (fruiting wire at 48" and foliage wire at 64–66" in height). Spacing is 8x12 with 80 vines/row.

There were four rows per spray treatment (leaf removal and non-leaf removal were the central two rows). There were five treatments (non-sprayed control, bloom spray, pre-close spray, veraison spray and all three sprays) with four replicates of each treatment. Shoot removal (cordon suckering) was the only canopy manipulation technique used in this Chenin blanc vineyard when they began trials in 1984.

"In 1985, sprays were applied at bloom (mid-May), pre-close (mid-June) and veraison (mid-August)," reported Heil. Leaf removal was used in addition to shoot removal in 1985 because shoot removal alone was not effecting a significant change in the cluster microclimate. We took five to seven leaves above each cluster and two to three leaves below it. The difference between treatments was dramatic."

Dr. Mark Kliewer, UC Davis professor of viticulture, has been involved with topping and hedging trials since 1983 and with leaf removal trials at Wooden Valley, Greenfield and UC Davis since 1984. "We established the trials to modify and improve the microclimate around the clusters to improve fruit quality

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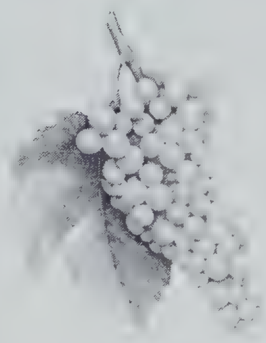

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and wine composition," said Kliewer. "We also wanted to see if we could reduce the *Botrytis* (bunch rot) problem.

"Our technique was to generally remove leaves touching the fruit and essentially all leaves up to and opposite the cluster, including the laterals. We also tried opening a window above the fruiting zone for vines on a 'T' trellis. This was effective in letting light in, but leaf removal around the cluster was most effective. It accomplished everything that additional leaf removal did."

Kliewer related that the most effective leaf removal technique is just removing leaves around clusters, being sure to remove any leaves that touch the fruit. "In most of our trials, leaf removal has resulted in earlier sugar accumulation (about .5° Brix). Malates and potassium tended to be lower and phenolics higher than on non-leaf removal vines."

He suggested that increased light and temperature due to fruit exposure probably caused lower malates, but cautioned that not enough was known about the exact physiological role these older (basal) leaves play in fruit ripening to explain the effect of leaf removal on fruit composition.

"People have suggested that these leaves are parasitic and act as carbohydrate sinks, but I'm not sure this is true," adds Kliewer. "We did some experiments (unpublished) a long time ago using labeled carbon (C_{14}) and could not detect any photosynthate going into them even when we excluded all light from reaching them. The physiological mechanism of earlier sugar accumulation in these berries is unknown." Kliewer has some critical physiological experiments planned for the 1986 growing season.

Kliewer commented on the fear that leaf removal would affect fruitfulness, explaining that although experimental evidence suggested that leaves nourish (supply photosynthates to) buds, they subtend and possibly affect fruitfulness. Fruitfulness is largely determined at flowering, so leaf removal after this time (especially 2–3 weeks after set) would have very little, if any, effect. He cautioned that proper experiments over a period of at least three years would be needed to prove this.

"We are planning trials to determine the best timing and levels of leaf removal and its effect on different cultivars," added Kliewer. He noted that Sauvignon blanc, Chardonnay and Chenin blanc were receiving the most attention now because of their dense canopies and high returns/acre. He suggested that leaf removal should be examined on other varieties (red and white) with the aim of reducing total chemical use in vineyards and reducing the chances of building up fungal resistance to these sprays.

More academic research is needed to determine the physiological effects of leaf removal, but many growers have been using this technique commercially since 1983 and further examination of their results should prove beneficial.

Doug Hill, manager of Jaeger Vineyards, St. Helena, CA, has used leaf removal on 200 acres of Chardonnay since 1983. His vines are on AxR 1, planted 8x10 in clay-loam soil in 1973-75. They were cane-pruned on a two-wire vertical trellis (fruiting wire at 48" with a foliage wire at 60") until 1981. Then he converted to bilateral cordons on a three-wire trellis with a 14"-wide cross arm 14" above the cordon (fruiting) wire. Shoot crowding and early fall rains enhanced bunch rot in 1982, so Hill began leaf removal in 1983.

Hill believes that primary *Botrytis* infection occurs during flowering and is experimenting with bunch rot sprays (1 ½-lb Benlate and 3-lbs Dithan/acre) at 5% bloom on ten acres, but considers leaf removal the best method for controlling rot. "We've done spray trials for several years to find the best method of controlling rot," says Hill. "But I haven't found anything that excites me as much as leaf removal."

In fact, he relies on leaf removal to control rot on the rest of his 200 acres of Chardonnay as he doesn't use any bunch rot sprays. Hill reports that he could easily lose one ton/acre due to rot and that leaf removal reduces this loss by 50%. With Chardonnay at $1,200/ton, this is a saving of $600/acre.

"One man can cover about 700 vines/day, so it works out to about $.09/vine," says Hill. There are 545 vines/acre, making the leaf removal cost about $50/acre. Hill likes to begin leafing by June 15 and be finished by the first week of July before the clusters are closed up. "I haven't tried leafing any earlier than this because I believe there would be a problem with regrowth," Hill explained.

"I never accept the validity of experimental reports from growers showing results from any chemical application or cultural practice unless a control is included in the experiment," Hill continued. "Ninety percent of the time I find that growers have failed to include such controls within the same vineyard block. Also, as we well know, different growing seasons yield different results due to environmental changes within the vineyard from one season to the next.

"The first year we practiced leafing we did only every other row throughout the entire vineyard. That gave us good reference points in many separate locations for comparing the benefits of leafing. It appeared that leafing did not inhibit incidence of rot as can sometimes be achieved through properly-timed chemical applications.

"However, it did achieve significantly less total rot as a percentage to healthy fruit in the field. Also, what works well in one vineyard may not necessarily be effective in all vineyards. Obviously, *Botrytis* control has some complexities which are difficult to pinpoint; otherwise, we would not have such problems with prevention and control today."

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Burgundian Viticulture—Methods, Part I

Don Blackburn

Burgundy's soils and climate offer excellent conditions for weed growth. Generations of *vignerons* invested their backs in the four annual hoeings of their vineyards. Photos of stooped old men remind us of how wonderful is the convenience of progress.

About 1850, the Count de la Loyère started experimenting using horses in the vineyard to draw a plow. The results made believers out of traditionalists, and when imported pests became a great problem, horses carried spray rigs.

In the program commonly used in the period from 1850 to 1970, each vine row was 'hilled up' after the harvest to protect the graft union from winter cold. In the spring, the 'throwing back' operation re-leveled the ground and turned the weeds under.

Today, cultivation has been largely replaced by herbicides because of the need to cut labor and equipment costs. Also, Burgundian soils—like many others—resist erosion better when uncultivated. Herbicides now used are pre-emergent, systemic, or contact. Band-spraying under the row is not practical given tight spacing. Some growers worry about the long-term influence of adding phytotoxins to the soil year after year.

In 1787, Thomas Jefferson visited France's wine regions to gather information for his viticultural endeavors in Virginia. One observation often repeated to him was that fine wine grapes were produced by old vines grown on poor soil with a very restricted fertilizer program. In fact, the tradition which emerged from the Middle Ages held that vineyards should not be fertilized. The practice was outlawed in 1395 by the Duke of Burgundy, Philippe Le Hardi.

Because quality vineyards were typically located on hillsides, the soil which eroded downhill had to be brought back toward the top. Workers transported the dirt uphill in hods on their backs. An extension of this practice involved bringing soil in from some distance in horse-drawn wagons. Around 1750, for example, the already-famous vineyards of Vosne-Romanée received substantial quantities of foreign soils. Quality-conscious growers took soil from the top of the mountain, whereas others brought in rich earth from bottomland along the Saone River.

Addition of manure became common in the 19th century only after growers discovered that the practice did not impart an off-flavor to the grape and then to the wine. That fear had previously been a major reason for not using horses in the vineyard as draft animals.

Arthur Montroy, in his report published in the 1887 Bulletin of the Beaune Committee of Agriculture, described his conclusions based on work in vineyard fertilization. He recognized the viticultural value of manure, but stressed the need for mineral amendments to supplement its benefit. Montroy found that

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quantities of manure which offered a proper dose of nitrogen were insufficient in phosphoric acid and potassium. Montroy recommended for Burgundian soils 1.5 metric tons of manure/hectare as well as 25 kg each of P_2O_5 and K_2O.

Of primary importance is the fact that Burgundian vineyard soils have supported vines for many generations—in some cases 20 or 30 human generations. The New World has had, in comparison, little time to lose its inherent fertility. In the six centuries preceding the advent of manure and mineral amendments (my research gets sketchy beyond 1200 A.D.), vineyards were propagated in place and seldom ripped out as a whole block. Dead vines were replaced individually. Soil fertility was low. It decreased inevitably over time. But given the grape yields of less than one ton/acre, the soils apparently could handle it.

The modernization of the early 19th century increased yields somewhat. *Phylloxera vastatrix* and other diseases weakened the vine after 1850, adding to the need for increased soil fertility. Also, as own-rooted vineyards succumbed to the disease, they were torn out in whole blocks and replanted on rootstocks between 1870 and 1920. These changes solidified the need for organic and mineral fertilization.

In the ensuing decades, Burgundian soils supported a succession of vineyards, each lasting 50–75 years. Initially, some were ripped out sooner when their rootstocks proved ill-suited to the locale. However, the community as a whole sought to respect the tradition of old vines producing the best wine.

This principle may not be evident to everyone. The French have long held that the finest wines reflect most vividly the local character of the vineyard. Wines of lower rank tend to display the more common (vulgar) flavors of the given vine variety, or simply a generic wine flavor. It follows directly in the French doctrine that the longer a vine grows in a given habitat, the more it becomes a reflection of that site. Its roots exploit a larger and larger area of soil, and draw nutrients in an increasing depth (radius) from the vine trunk.

Beyond the notion of local character, the older vine is considered superior in that its greater pool of resources (in its existing tissue and also available to its deep roots) guarantees a greater regularity in grape production. For example, the older vine's lower vigor will resist the qualitative detriment of a year that favors excessive vegetative growth. Also, in drought conditions, the older vine will be more able to ripen its crop because 1) its root system is more extensive, and 2) its stored resource pool is larger in proportion to its crop level.

The term 'old vine' generally refers to a vine beyond age 40. The excesses of youth are considered to be passed by the age of 25, at which stage the vine behaves as an adult.

During the first half of the 20th century, France's vineyards, reconstructed by grafting, matured and re-established a gamut of ages as some plants responded better than others to the test of time. Older plots once again proved themselves capable of producing superior wines.

This situation was shaken up by two severe winter freezes in 1940 and 1956. The latter remains quite infamous in the memory of growers throughout France. Whole vineyards were wiped out as far south as Bordeaux and Châteauneuf du Pape. Folks at Château Cheval Blanc in St. Emilion tell stories of vines split wide open when the sap rose in February 1956, just before the temperature fell to -20°C. Burgundians remember the 1940 freeze more acutely, perhaps because the suffering it caused was compounded by the arrival of the Nazis. The major point of relevance to us is the influence of these freezes on Burgundian viticulture. This was to suddenly, drastically, and perhaps permanently reduce the average vine age in Côte d'Or, as in France as a whole.

As the multitude of new plantings came into production, wines became lighter and faster-maturing. This trend did not preclude vintages such as 1959 and 1961 from producing excellent wines in the classical tradition. It did, though, awaken growers to the advantages of higher yields and more 'accessible' wines. In the realm of their awareness of the modern world, it brought them up to date. Today, most vineyards are ripped out when they reach 35–45 years of age.

As growers became accustomed to planting grafted vines and ripping out whole blocks, they found that they needed to leave the land fallow for some time before replanting. This period often exceeded five years, especially in the areas of Burgundy where the soil is particularly poor (e.g. Hautes Côtes, Chablis). It was observed that no amount of fertilizer added after ripping out an existing vineyard could rejuvenate the soil as completely as 5–7 fallow years with a cover crop. During the past generation it has increasingly seemed extravagant to forgo so many crops. Many growers decide to plant 'vigne sur vigne' ('vine on vine', or replanting in the spring right after ripping out vines the previous autumn). Others wait one year to leave time for chemical soil disinfection.

Rootstocks

Early rootstock experiments were carried out in southwest France. Burgundians benefited from the lessons learned, appreciating fully the need to choose particular varieties well-suited to their habitats. The climate required varieties hastening maturity, so the vigorous *rupestris x berlandieri* rootstocks (99R, 101R) were not popular. The same is even more true for *Rupestris du Lot* (*Rupestris St. George*), so widely planted in California precisely for the vigor it imparts.

In the nearly flat benchland at the foot of the Burgundian slope, *Riparia Gloire* (*Vitis riparia*) turned out to be very successful because of its tolerance to high soil moisture. It shared that setting with 3309C (*riparia x rupestris*), somewhat more vigor-

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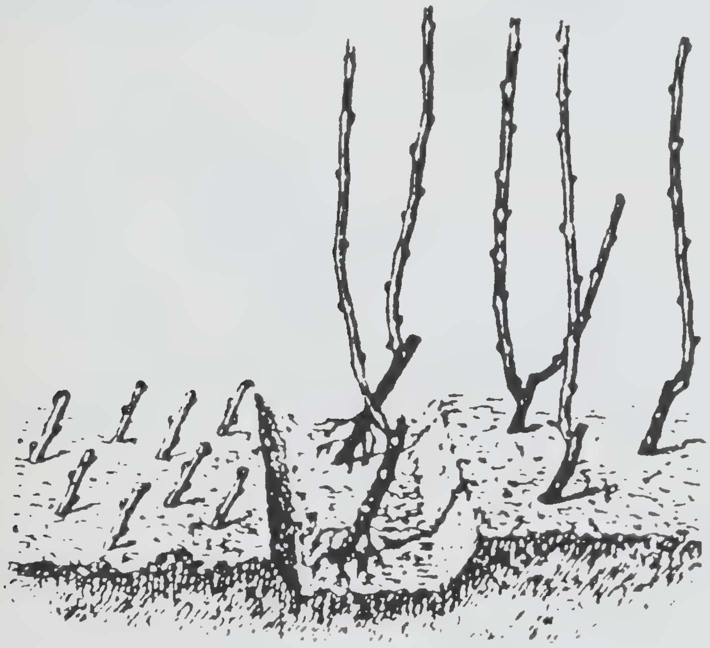
ous, but less sensitive to calcium-induced chlorosis. Both of these varieties encouraged early ripening by moderating the high vigor potential of these soils.

Vineyards on the slopes had enough active calcium to require *riparia x berlandieri* rootstocks. Of these, 161.49C was felt to yield good quality, but it has been phased out because of viral infection and a propensity for vascular collapse under moisture stress ('thyllosis'). Yet old *vignerons* still speak wistfully of 161.49C as if it were a woman whose memory conjures up images of one's youth, when the world was a better place.

Today, all these varieties, well-adapted to specific sites, have been largely replaced by SO4 (*riparia x berlandieri*), which appeared on the market in the 1930s. It thrives in most habitats, imparts more vigor than the older varieties, and favors the three tons/acre now sought by most growers. SO4, extensively planted internationally, was an early subject of certification, and is the major rootstock used in clonal selection in Côte d'Or.

Choice of rootstock is a crucial element in the group of interrelated factors determining grape quality. This is especially true in the rigorous setting of Burgundy. Delayed ripeness prolongs crop maturation into the bad weather of autumn. Excessive vigor results in wines lacking color and body. Some other viticultural areas are endowed with a more benevolent or a more predictable climate. Some varieties are less sensitive to overcropping than is Pinot noir. Still, even where the margin for error is greater, today's market does not permit us to pass up quality potential.



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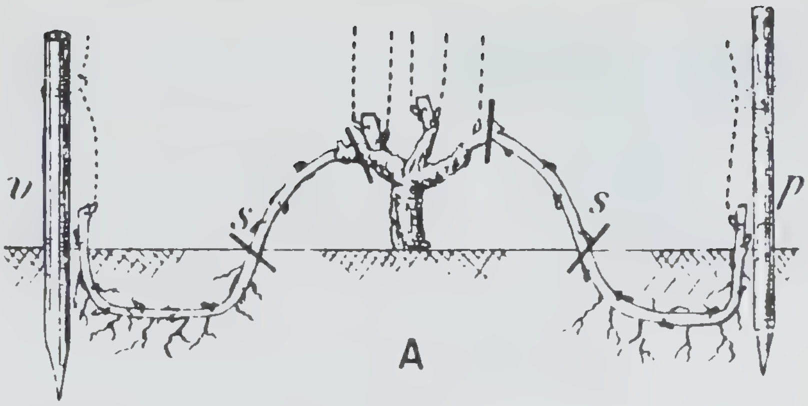

'Marcottage'

Grafting

The gradual disappearance of own-rooted vines between 1880 and 1920 was a reflection of winegrowers' admission that injections of carbon sulfide, as well as other desperate control measures, were not effective enough to guarantee continued viability of the vineyard. The 1869 Viticultural Congress of Beaune first discussed the possibility of grafting grape vines, but it wasn't until 1887 that authorization was given to import American vines into Côte d'Or. By then, phylloxera had been there for nine years.

Fans of French wines often speculate as to the contribution of grafting in the quality evolution over the last century. The question is often posed, "Are today's grafted vines equal to their own-rooted predecessors?" It is uncertain to what extent our recent experience in that matter here in the New World can be applied to the French context. Nostalgic *vignerons* will bemoan the high vigor and fertility of many rootstocks, yet they forget the inherent vigor of *Vitis vinifera*, which is greater than some of the varieties onto which it is grafted.

Pierre Vialla, a highly-respected 19th century agronomist and viticultural researcher, broached this subject in an 1896 publication. "Some growers fear that American varieties would induce a high manure need. In fact, they do not demand more than *vinifera*. Moreover, results obtained in Burgundy, Beaujolais, and the Médoc have shown grafted vines to be equal or superior to own-rooted vines in wine quality. Of course, old vines in own-rooted plots offer a quality superior to grafted vines, but the only fair comparison is between vines of

continued p.42

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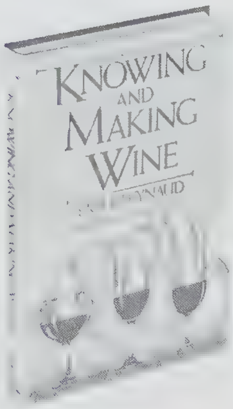

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Proprietary Wine Survey

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Bainbridge Island Winery
Bainbridge Island, Washington

Ferryboat White, which has been produced by Bainbridge Island Winery since 1982, is named for the ferryboats that transport the inhabitants of Bainbridge Island to and from Seattle. Annual production has grown from 1,100 gallons in 1982 to 2,000 gallons in 1985. Ferryboat White is similar in style to a liebfraumilch, with various *vinifera* blended into a Muller-Thurgau base. Varietal bottlings at Bainbridge Island Winery include Muller-Thurgau, Madeleine Sylvaner, Gewurztraminer, White Riesling, and Chardonnay.

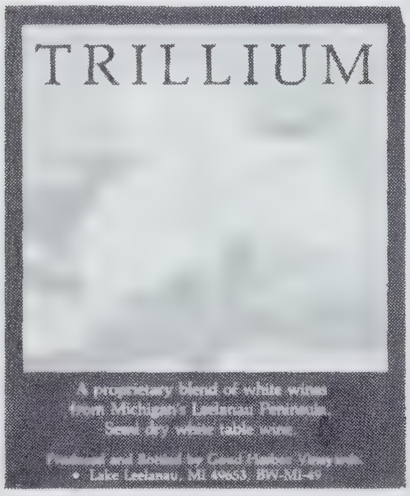
Ferryboat White is sold at the winery, where it comprises 20–30% of sales. It is also found in restaurants, categorized as 'white table wine'. The proprietors credit the name with enhancing the wine's popularity, as well as calling attention to the old ferryboat *San Mateo*, depicted on the label.

Ferryboat White
Alcohol: 9.0–11.0%
Total Acidity: 0.80 g/100mL
Residual Sugar: 2.2 g/100mL
Grapes: Muller-Thurgau, Madeleine Sylvaner, White Riesling, Chardonnay
Suggested Retail Price: $4.95

Good Harbor Vineyards
Lake Leelanau, Michigan

Trillium, the proprietary wine from Good Harbor Vineyards, is a semi-dry blend of white wines from Michigan's Leelanau Peninsula. The wine is named for a white flower native to Michigan, which is very abundant in the spring. The wine was introduced in 1985 with an initial bottling of 1,250 cases, and was increased to 1,900 cases in 1986. It is available in the winery's tasting room, where it accounts for 40% of sales. The wine is also available in retail outlets and restaurants.

Good Harbor Vineyards also has varietal bottlings of Seyval, Vignoles, Riesling, and Marechal Foch, as well as limited amounts of fruit wine.



Trillium
Alcohol: 11.0–12.0%
Total Acidity: 0.80–0.90 g/100mL
Residual Sugar: 1.0–1.75 g/100mL
Grapes: Seyval, Vignoles, Riesling
Suggested Retail Price: $5.50

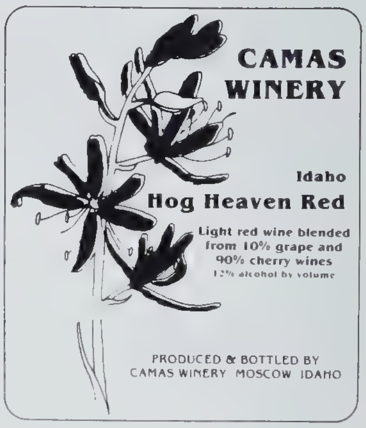
Camas Winery
Moscow, Idaho

Early settlers in the Moscow area found their pigs going 'hog-wild' for the delicious taste of the blue camas bulbs growing nearby. The young community thus became known as 'Hog Heaven', a nickname which provided inspiration for Camas Winery's proprietary wine, Hog Heaven Red.

Hog Heaven Red is described on the label as a 'light red wine blended from 10% grape and 90% cherry wines'. Production began in 1984 with 200 gallons, and increased in 1985 to 300 gallons. Since 1984, the percentage of cherry wine used has increased from 30% to 90%.

Hog Heaven Red is sold at the winery, where it accounts for 10% of total sales; in retail outlets; and in restaurants, where it is sold as a 'special' by being advertised on a chalkboard or announced as such by the waitperson, rather than being on the regular wine list.

Varietal bottlings from Camas include Cabernet Sauvignon, Chardonnay, and White Riesling.


CAMAS WINERY
Idaho
Hog Heaven Red
Light red wine blended from 10% grape and 90% cherry wines
12% alcohol by volume
PRODUCED & BOTTLED BY CAMAS WINERY MOSCOW IDAHO

Hog Heaven Red
Alcohol: 12.0–13.0%
Total Acidity: 0.52 g/100mL
Residual Sugar: 2.4 g/100mL
Grapes: Cabernet Sauvignon
Quantity Produced: 120 cases
Suggested Retail Price: $4.75

Boeger Winery
Placerville, California

Boeger Winery produces two proprietary wines, both named after the nearby town of Placerville. Hangtown Red recognizes the original name of Placerville during the California Gold Rush, while Sierra Blanc refers to Placerville's location in the Sierra Foothills. Both wines are available in the tasting room and retail outlets. A side panel describes the wines to consumers. Boeger's varietal bottlings include Cabernet Sauvignon, Merlot, Zinfandel, Chardonnay, Sauvignon Blanc, Chenin Blanc, and White Zinfandel.

Hangtown Red has been produced since 1974, with Sierra Blanc production beginning in 1980. Sales of Hangtown Red have remained fairly constant over the years, while Sierra Blanc has seen a steady increase, going from 500 cases to 1,650 cases. Suggested retail price is $4.50. Sierra Blanc has become very slightly sweet (1.0 g/100mL residual sugar) in recent blends, as opposed to completely dry earlier blends. TA is 0.60–0.75 g/100mL. The wine is produced from Chenin blanc, Sauvignon blanc, and Sémillon.

1982 Hangtown Red
Alcohol: 12.5–13.5%
Total Acidity: 0.60–0.75 g/100mL
Residual Sugar: dry
Grapes: Zinfandel, Grenache, Ruby Cabernet, Carignane, Petite Sirah
Quantity Produced: 800–1,200 cases
Suggested Retail Price: $4.00

McLester Winery
Inglewood, California

The flight pattern of Los Angeles International Airport may seem an unusual location for a winery, but the proprietors of McLester Winery have capitalized on it by introducing Runway Red and Runway White. Three lots of each have been produced to date, along with varietal bottlings of Zinfandel and Cabernet Sauvignon. Runway Red is a dry wine made from Ruby Cabernet and Barbera, while Runway White is produced from French Colombard, Chenin blanc, and Muscat. Both wines' suggested retail price is $2.75.

A third proprietary wine from McLester is Suite 13, a dessert wine named for the 13th letter of the alphabet ('M', for McLester) and its release date – Friday, July 13, 1984. Suite 13 is 100% Muscat Canelli, with alcohol of 13.0%, TA of 0.90 g/100mL, and residual sugar of 13.0 g/100mL. Suggested retail price is $7.50.

Runway White and Red and Suite 13 are sold in the winery's tasting room, where the white comprises 20% of total tasting room sales, the red accounts for 10%, and the dessert wine about 5-7%. The wines are also sold in retail outlets. A side panel on the label describes the inspiration for the wines' names. The McLesters feel that a catchy name enhances public acceptance of proprietary wines.

Runway White
Alcohol: 10.5 – 11.5%
Total Acidity: 0.60 – 0.80 g/100mL
Residual Sugar: 0.80 – 1.0 g/100mL
Quantity Produced: 500 cases

Whitehall Lane Winery
St. Helena, Napa Valley, California

Whitehall Lane Winery's proprietary wine is Fleur d'Hélène. Fleur d'Hélène, named partly for the nearby town of St. Helena, is compared by the proprietors to a Grand Cru Beaujolais. Their favorite Beaujolais Villages is Fleurie; thus Fleur d'Hélène.

Fleur d'Hélène can be found in the tasting room, retail outlets, and restaurants. It is usually categorized as Pinot Noir or Beaujolais on wine lists. Confusion over classification and identification remains a problem, despite a brief front-label description of the wine. Four vintages of Fleur d'Hélène have been produced.

In addition, there was one vintage produced of a white table wine known as Blanc d'Hélène. It was a blend of all white grapes (Chardonnay, Sauvignon blanc, Chenin blanc) grown on the Whitehall Lane ranch and was from the first crop from vines planted in 1981. In subsequent years, estate-grown varietals have been produced from these vines.

WHITEHALL LANE
FINE WINE
1983
WINERY
Fleur d' Hélène
Napa Valley Red Table Wine
A light, fruity and elegant dry red wine.
Produced from Pinot Noir grapes.
Vinified in the style of a Grand Crus Beaujolais.
Produced & Bottled by Whitehall Lane Winery
St. Helena, Napa Valley, California · Alcohol 12% By Volume

Fleur d'Hélène
Alcohol: 12.0 – 13.0%
Total Acidity: 0.60 – 0.70 g/100mL
Residual Sugar: dry
Grapes: Pinot noir
Quantity Produced: 1,000 cases
Suggested Retail Price: 1985 – $7.50; previously $6.50

Almaden Vineyards
San Jose, California

Almaden recently added a new proprietary wine to their 'mountain wine' collection – Blush Chablis. Produced from a blend of red and white grapes, Blush Chablis' production began in January 1986 with 110,000 cases of various-sized bottles. Estimated number of cases to be produced for 1986 totals 750,000 – 1 million.

The final blend for Blush Chablis was determined by a series of taste tests involving visitors to Almaden's tasting rooms. When developing new products, Almaden asks visitors to blind-taste various in-house blends versus each other and versus competitors' blends. Tasters then decide which one they like best. This information is used in determining the wine's final blend.

Blush Chablis is sold in the winery's tasting rooms, in retail outlets, and in restaurants. A back label describes the wine.

Blush Chablis
Alcohol: 12.5%
Total Acidity: 0.75 g/100mL
Residual Sugar: 3.0 g/100mL
Suggested Retail Price:
750mL – $2.85; 1.5L – $4.45;
3L – $7.10; 4L – $8.25; 4L box – $8.00

PW reviewed the following wineries in previous issues:

Leeward Winery
Cedar Hill Wine Company
Mountain House Winery
Naylor Wine Cellars
Pat Paulsen Winery
Edmeades Vineyards
Trefethen Vineyards
Granite Springs Winery
Buena Vista Winery
Joseph Phelps Vineyards

cont. from p. 39

similar age, grown with the same methods in the same soil.

"Our experiments in the Haut Médoc, St. Emilion, Ermitage (*sic*), Côte Rôtie, and Châteauneuf du Pape over the last 15 years have, without exception, shown that grafted vines brought no decrease in quality, and tend, in fact, to increase it."

Propagation

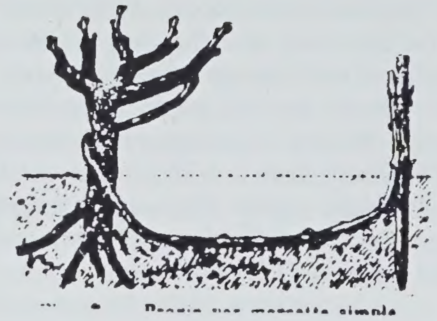
Before the advent of grafting, vineyards were rejuvenated in place. 'Marcottage', burying a cane tip and later severing it when roots had formed, was used to fill in the gaps where single vines died. Another method, 'provignage', called 'layering' in English, allowed rejuvenation of a whole block. It maintained the vine's trunk quite low and emerging from the ground at a 45° angle. When a particular plot was scheduled for renewal, a hole was dug next to each vine, and the trunk pushed down into it with the roots still attached. A single cane remained above ground level. Pruned to four buds, it assured continued foliar growth.

The proportion of each vineyard that was 'layered' each year, block by block, determined the rate of rejuvenation. The way in which this is related to vine age is difficult to determine, because of the nature of 'layering'. The repeated burying of a vine trunk has a significant influence on a vine, but less so than the removal and replacement of the whole vine.

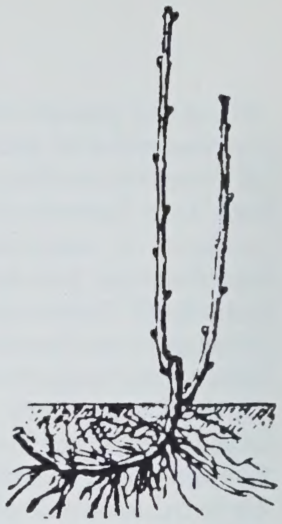
Several accounts agree that during the Middle Ages about 0.3% of the vines in a vineyard were rejuvenated each year. By the 19th century, this rate had risen to 5%. This evolution accompanied a widening spacing and a relative increase in yields.

'Provignage' and 'marcottage' were discontinued when the spread of phylloxera required that all subterranean vine tissue be non-*vinifera*. Field grafting was a popular practice in the late 19th and early 20th century. It has gradually lost favor since the First World War. In fact, field grafting is almost unknown in the Grand Cru regions of France. One reason for this is that bench grafting fits in better with clonal selection.

Many of my classmates in viticulture school were accustomed to spending several weeks each winter grafting with their fathers. Some growers would invite a neighbor over for company. They would drink wine and chew the fat as each did his pile of grafts. Nowadays, growers have less time than money, so they buy their grafted, rooted vines.



'Marcottage'– Alternative method



A severed 'marcotte'

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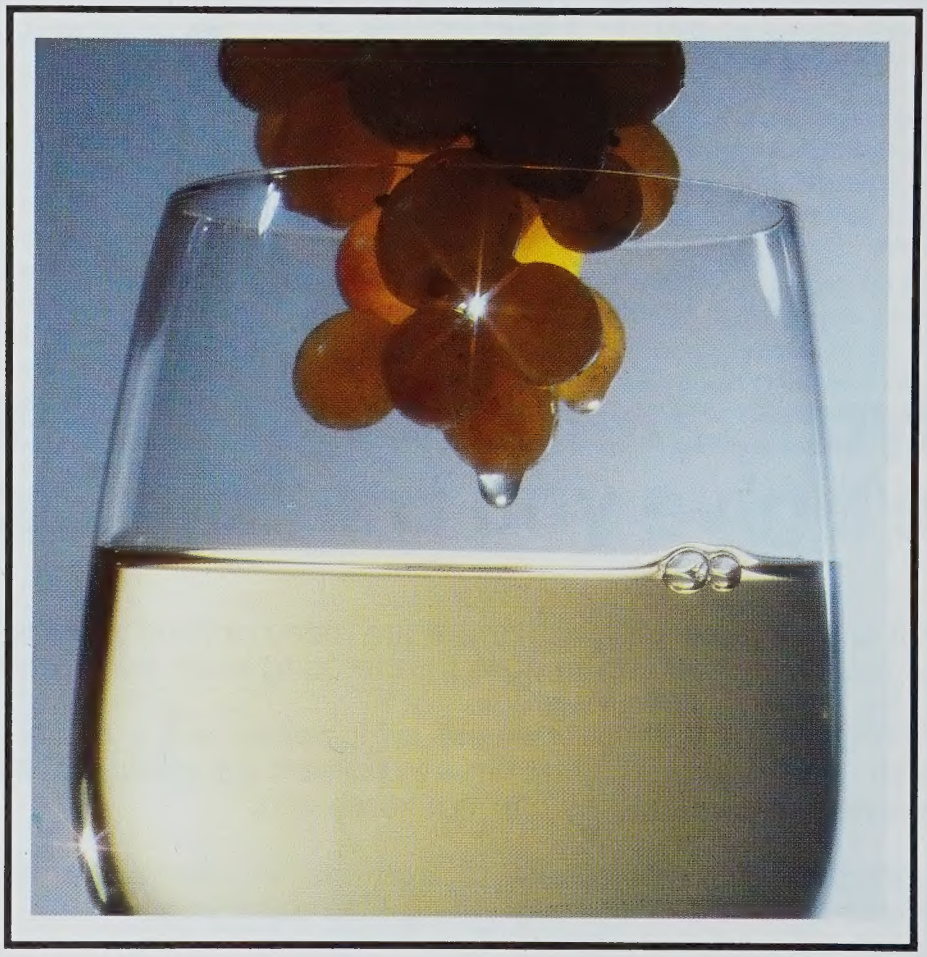

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